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ABSTRACT

A study of the cost of distance education institutes in India with different size classes involved nine institutions. The sample included 47 percent of total enrollment in distance education institutions in India. The study was restricted to recurring costs and examined the shares of different components of costs and the sources of funding. It tested the hypothesis that the cost per student declines with increase in enrollment. An analysis of the components of costs showed that the absence of uniform staff requirements created different environments in which distance education institutions in India operated. Pooled regression analysis for 83 observations of all the distance education institutions, using dummy variables for each institution separately, confirmed the negative relationship between enrollment and cost per student, that is, as enrollment increased, cost per student had a tendency to decline. Regression analysis of data from 1984-85 and 1985-86 made clear the negative correlation between enrollment and cost per student, though the r values indicated that the relationship was weak and not very significant. The hypothesis that an increase in enrollment resulted in a decline in costs was found to be valid. Enrollment and proportion of honors students in total enrollment were confirmed as being positively correlated to unit cost of education per student. (YLB)

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STUDY OF COST OF DISTANCE EDUCATION INSTITUTES WITH DIFFERENT SIZE CLASSES IN INDIA

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NIEPA RESEARCH PROJECT

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RUDDAR DATT

SCHOOL OF CORRESPONDENCE COURSES AND
CONTINUING EDUCATION
UNIVERSITY OF DELHI

1991

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INTRODUCTION

This Research Project was the outcome of the First National Workshop organized by Prof. M. Mukhopadhyay and Dr. K. Sujata at National Institute of Educational Planning and Administration (NIEPA), New Delhi held from 12 - 16 October 1987.

"Study of Cost of Distance Education Institutes with different Size Class" required the collection of data. There was great difficulty in pursuading Institutes to part with information. This was more so in such cases where the Institute was generating a surplus. But thanks to friends who helped me by providing necessary information. In this connection, I would specially place on record the help given by the following:

Dr. M. Shanmugham, Director, Institute of Correspondence Education, Madras University, Madras.

Dr. K. Ansari Baig, Director, Directorate of Distance Education, Annamalai University, Annamalai.

Dr. S. Bhatnagar, Director, Directorate of Distance Education, Panjab University, Chandigarh.

Dr. S. K. Gupta, Director, Directorate of Correspondence Courses, Himachal Pradesh University, Shimla.

Dr. Kishore Valicha, Director, Directorate of Distance Education, University of Bombay, Bombay.

Dr. (Mrs) Uma Vandse, Director, Department of Correspondence Courses and Distance Education, SNDT Women's University, Bombay.

Dr. Yogendra Pratap Singh, Director, Institute of Correspondence Courses, Allahabad University, Allahabad.

Mr. D. K. Goyal, M.A., Ph.D. provided me immense help in collecting statistical information, doing tabulation work and processing and re-processing data as and when required. His patience and continuous zeal helped me to sift information. His personal visits to all the directorates studied also helped to secure information as also cross-check it with concerned persons on the spot.

Shri R. N. Chanda provided full secretarial assistance in typing, retyping, correcting and preparing the report.

Dr. Gaurav Datt and Dr. (Mrs) Geeta Chaudhri helped in conducting regression analysis and made very useful suggestions regarding the use of statistical techniques of analysis. Dr. Dalip S. Swamy, Professor of Business Economics of Delhi University was extremely helpful to me in discussing the implications of various statistical inferences, suggest further refinements. Mr. Aditya Arya, Department of Commerce, SGTB Khalsa College, Delhi provided me support in analysing data on Delhi University colleges and helped to run the regression analysis on the Computer.

Although originally, I had intended to develop a quality index in distance education, but my discussions with colleagues in the profession convinced me that there are innumerable difficulties in defining educational output, moreso in standardising output. I, therefore, abandoned the idea because of real difficulties of measurement.

May I take this opportunity to express my deep thanks to Professor Satya Bhushan, Director, NIEPA and Professor M. Mukhopadhaya for condoning the delay in the completion of the Project Report and also providing me the academic and financial support in this research study.

RUDDAR DATT

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24 March 1991

CONTENTS

CHAPTER		PAGES
I	Study of Cost of distance education institutes with different class sizes -- the purpose of the study.	1 - 10
II	Institute of Correspondence Education University of Madras, Madras	11 - 27
III	Directorate of Distance Education, Annamalai University	28 - 34
IV	School of Correspondence Courses & Continuing Education, University of Delhi, Delhi	35 - 42
V	Directorate of Distance Education University of Bombay, Bombay	43 - 46
VI	Directorate of Correspondence Courses Himachal Pradesh University, Shimla	47 - 50
VII	Department of Correspondence Courses and Distance Education, SNDT Women's University Bombay.	51 - 55
VIII	Directorate of Correspondence Courses Panjab University, Chandigarh	56 - 64
IX	Institute of Correspondence Courses, Patna University, Patna	65 - 68
X	Institute of Correspondence Courses and Continuing Education, Allahabad University Allahabad	69 - 72
XI	Pooled Regression Analysis	73 - 75
XII	Coursewise cost per student in Annamalai University, Directorate of Distance Education	76 - 85
XIII	Coursewise Costs of the School of Correspondence Courses and Continuing Education, University of Delhi	86 - 104
XIV	Comparison of Cost per student in School of Correspondence Courses (Delhi) with 12 Colleges of Delhi University	105 - 113
XV	Analysis of factors determining cost per student in Delhi University Colleges.	114 - 124
	Abstract and Conclusions	i - xviii

STUDY OF COST OF DISTANCE EDUCATION INSTITUTES WITH DIFFERENT CLASS SIZE

THE PURPOSE OF THE STUDY:

Costs in distance education are dependent on a variety of factors viz.. enrolment, type of courses, the size of the teaching faculty, the size of supporting staff, the duration of Personal Contact Programme, stipulation regarding students assignments, Library-cum-Study Centre, Audio/Visual programmes, cost of printing, postage etc.

Cost in distance education can be divided into two categories viz.. recurring costs and non-recurring costs. The cost function in distance education can be expressed as under:

C = F + V where C represents total cost, F represents fixed or non-recurring cost and V represents variable or recurring cost

Since information about fixed cost in terms of expenditures on buildings and equipments was not available separately, this study is restricted only to recurring cost in distance education.

For this purpose, we have selected the following institutions :

1. School of Correspondence Courses and Continuing Education, University of Delhi, Delhi.
2. Institute of Correspondence Courses, Bombay University, Bombay
3. Department of Correspondence Courses and Distance Education, S.N.D.T. Women's University, Bombay.

4. Directorate of Distance Education
Himachal Pradesh University, Shimla.

5. Institute of Correspondence Education
Madras University, Madras.

6. Directorate of Correspondence Courses
Punjab University, Chandigarh.

7. Directorate of Correspondence Courses
Allahabad University, Allahabad.

8. Directorate of Correspondence Courses
Patna University, Patna

9. Directorate of Distance Education
Annamalai University, Annamalai

These institutions, it may be observed, have been chosen from a stratified sample on the basis of enrolment in various ranges. Secondly, the choice of the particular institution has been purposive in view of the fact that many Directorates, more especially, those who charge high fees and keep their cost pegged at a low level by providing poor quality of services, are reluctant to provide any information.

The selection of institute is, therefore, both stratified and purposive, because the study cannot progress without the availability of the data.

COMPONENTS OF COST INCLUDED IN THE STUDY

For the purpose of collecting recurring costs during a particular year, the following heads of account have been taken into consideration:

1. **Teaching Cost** which includes the payment of salary to the teachers (whether working on full-time or part-time basis).

2. **Supporting Staff** Cost includes the salary of the Administrative Staff employed to support the distance education programme.

3. **Library Cost** includes expenditure on books, stationery and furniture, Library-cum-Study Centres

4. **Personal Contact Programme costs** include cost of payment made to teachers and administrative staff for the conduct of the Personal Contact Programme Classes as also the payment made in the form of rent of the buildings hired for the purpose.

5. **Printing Cost** includes the cost of paper plus the cost of printing for reading materials. It includes also the cost of printing of prospectus and such other items (printed stationery) used in the distance education institutes.

6. **Lesson Writing Cost** includes the payment made for the preparation of reading materials with the help of persons outside the institutes.

7. **Miscellaneous Cost** includes cost of stationery, postage, telegrams, municipality tax, water charges, electricity charges etc. made for running the institute.

On the basis of the total cost thus arrived at for different institutions and divided by the number of students enrolled during a particular year, the cost per student has been calculated. Table 1 presents the cost of distance education per student in different institutions along with the enrolment at current prices (in Rupees).

A close perusal of Table 1 reveals that we have the experience of different kinds of institutions which works out as under:

1. There has been a steady increase in enrolment, for instance in the Delhi University after 1980-81. But from 1975-76 to 1980-81 there was a decline in enrolment. This decline was the result of two major decisions:

   (a) The University off Delhi decided to permit only such students in the B.A./B.Com. courses who

obtained 40% marks in the higher secondary/ equivalent examinations.

(b) Introduction of 10+2 system of education at the higher secondary level resulted in the fall of enrolment during 1979-80, 1980-81, and 1981-82 because firstly the number of schools who switched over to the new system was very low and secondly, for some years there were only two classes instead of three in the B.A./B.Com. courses but after 1981-82, there was a gradual increase in enrolment and this gathered momentum after 1986-87 reaching an enrolment level of 22,743. Thereafter, by 1988-89, enrolment rose to 33,853.

Similar is the experience in the Institute of Distance Education, Madras which started in 1982-83 with an enrolment of 9,615, but during the course of six years, this enrolment went up to 94,425 in 1988-89.

The experience of Annamalai University with an enrolment of 21,052 in 1981-82 rising to 41,545 in 1986-87 also show a sharp increase in enrolment.

However, there is a second group of distance education institutions where enrolment has been either static or has been rising at a very slow rate or declining. In this context, we have Punjab University, Chandigarh which had 10,011 enrolment in 1977-78 and the enrolment gradually fall to 7,725 in 1984-85 and then it rose to 9,713 in 1987-88 and again fell to 7,719 in 1988-89.

Similarly, the Bombay University has also shown very wide fluctuation in the enrolment and the enrolment has ranged between the low level of 5,280 in 1980-81 to 15,148 in 1987-88.

Allahabad University and Patna University are both examples of low levels of enrolment. In Allahabad University, enrolment ranged from 1,591 in 1984-85 to 2,940 in 1988-89 whereas in Patna University, enrolment increased from 523 in 1979-80 to 4,167 in 1988-89.

This sample covers institutions in various ranges of enrolment. There are two institutes in the category of enrolment less than 5,000 in 1987-88. There are two from the category in the range of 5,000 to 10,000. Two from the categories 10,000 to 20,000, two in the category of 20,000 and 50,000 and one from the category in the range of 50,000 and above.

Enrolment Range	Location of Distance Education Institute
Less than 5,000	Allahabad and Patna
5,001 to 10,000	Panjab
10,001 to 20,000	Bombay, SNDT Women, Himachal Pradesh
20,001 to 50,000	Delhi, Annamalai
50,001 and above	Madras

We have also chosen some units like Himachal Pradesh University which specialised only in Post-graduate education as also in some professional courses like M.Ed.

THE HYPOTHESIS:

The hypothesis is that the cost per student declines with increase in enrolment.

There is however a serious methodological problem in finding co-relation between the cost and enrolment at current prices since some increase in cost is directly the consequences of improvement in pay scales of the teaching and non-teaching staff as also a rise in the cost of printing paper, cost of library books arising out of the increase in prices. Revision in postal rates as well as telegram charges also increases the cost. In other words the rise of enrolment does not only bring about economies of scale but it also, to some extent, neutralises the inflationary rise.

CHOICE OF DEFLATOR

The use of a deflator to convert an index from current to constant prices depends on the weights used in the index concerned. National income deflator, involving the entire economy, uses base year quantities. Similarly, consumer price index deals with composition and quantities of the consumption basket. The consumption basket of different types of workers differs from one another and also from the general consumer price index to the extent that the composition and quantity weights differ.

The types of items used in the provision of distance education range from wages and salaries of administrative and teaching staff, purchase of stationery, printing of lessons, purchase of books, postage etc. Production of

each one of these items when broken down into input factors suggests that a major component of the cost is similar to that of non-manual employees. Therefore, the deflator used for converting current price series into constant price series is consumer price index of non-manual employees.

To make the analysis more logical, it was decided to convert these costs into cost at constant prices. For this purpose we used 1970-71 as a base year and developed a linking factor (Table 1) on the basis of urban and non-manual employees and cost of living index. (Refer Table 1).

Thus, the cost per student at current prices (Table 2) was converted for each Directorate into cost per student at 1970-71 prices. The results of cost of distance education per student for each institutions at 1970-71 are presented in Table 3. The coefficients of co-relation between cost per student and enrolment was calculated.

TABLE 1

SCHOOL OF CORRESPONDENCE COURSES
UNIVERSITY OF DELHI
DELHI

YEAR	URBAN NON-MANUAL EMPLOYEES GENERAL INDEX BASE YEAR 1960=100	NO. OF STUDENTS	LINKING FACTOR BASE YEAR 1970-71	COST PER STUDENT (AT CURRENT PRICES IN RS.)	COST PER STUDENT (AT CONSTANT PRICES IN RS)
1975-76	277	13,722	0.63	311	195.93
1976-77	277	13,474	0.63	342	215.46
1977-78	296	13,203	0.59	370	218.30
1978-79	306	11,133	0.57	382	217.74
1979-80	330	8,355	0.53	493	261.29
1980-81	369	6,482	0.47	801	376.47
1981-82	413	6,759	0.42	863	362.46
1982-83	446	9,822	0.39	628	244.92
1983-84	492	13,825	0.35	613	214.55
1984-85	532	18,250	0.33	552	182.16
1985-86	568	21,466	0.31	563	174.53
1986-87	613	22,743	0.28	603	168.84
1987-88	668	27,478	0.26	635	165.10
1988-89	697	33,853	0.25	584	146.00

TABLE 2

COST OF EDUCATION PER STUDENT BY DIFFERENT INSTITUTIONS

IN RS. CURRENT PRICES

YEAR	DELHI UNIV.		BOMBAY UNIV.		SNDT UNIV.		H.P. UNIV.		MADRAS UNIV.		PUNJAB UNIV.		ALLAH. UNIV. ABAD		PATNA UNIV		ANNA. UNIV. MALAI	
	ENROL	COST	ENROL	COST	ENROL	COST	ENROL	COST	ENROL	COST	ENROOL	COST	ENROL	COST	ENROL	COST	ENROL	COST
1975-76	13,722	311																
1976-77	13,474	342																
1977-78	13,203	370																
1978-79	11,133	382	12,054	124.51							10,011	549.20						
1979-80	8,355	493	6,585	232.65	1,980	155.15	10,830	448.07			9,101	593.08			523	497.13		
1980-81	6,482	801	5,280	290.19	5,329	89.23	11,042	445.72			9,460	701.73			687	487.63		
1981-82	6,759	863	6,698	226.64	5,309	100.39	11,701	402.10			9,150	699.23			1,958	291.11	2,052	77.26
1982-83	9,822	628	7,448	212.75	8,578	67.38	11,701	328.38	9,615	533.84	8,741	816.59			1,567	435.23	25,397	103.23
1983-84	13,825	613	9,412	213.85	9,235	129.94	8,321	481.86	20,584	455.10	9,321	849.84			1,365	509.16	24,565	145.37
1984-85	18,250	552	12,302	129.13	10,129	145.61	6,944	634.38	42,214	266.54	7,775	1122.74	1,591	266.77	1,698	462.31	30,420	148.08
1985-86	21,466	563	12,701	167.58	9,152	172.43	7,181	637.82	67,968	263.69	8,899	955.96	2,331	221.35	2,268	547.62	39,311	132.14
1986-87	22,743	603	12,822	209.02	11,054	163.43	7,838	707.41	78,123	215.36	8,783	1124.83	1,602	511.98	2,376	573.23	41,554	171.89
1987-88	27,478	635	15,148	195.21	10,868	232.57	6,715	884.64	92,737	275.79	9,713	1282.43	2,291	431.37	3,616	394.63		
1988-89	23,853	584			11,752	242.00	13,090	619.84	94,425	456.57	7,719	1832.60	2,940	494.61	4,167	368.37		

TABLE 3

COST OF EDUCATION PER STUDENT BY DIFFERENT CORRESPONDENCE COURSES IN INDIA

10

IN RS. CONSTANT (1970-71) PRICES

YEAR	DELHI	UNIV.	BOMBAY	UNIV.	SNDT	UNIV.	M.P.	UNIV.	MADRAS	UNIV.	PUNJAB	UNIV.	ALLAH. ABAD	UNIV.	PATNA	UNIV	ANNA. MALAI	UNIV.
	ENROL	COST	ENROL	COST	ENROL	COST	ENROL	COST	ENROL	COST	ENROL	COST	ENROL	COST	ENROL	COST	ENROL	COST
1975-76	13,722	195.93																
1976-77	13,747	215.46																
1977-78	13,202	218.30																
1978-79	11,133	217.74	12,054	70.97	1,980						10,011	313.05						
1979-80	8,355	261.29	6,585	123.31	1,980	82.23	10,830	237.48			9,101	314.34			523	263.48		
1980-81	6,482	376.47	5,280	136.39	5,329	41.94	11,042	209.49			9,460	329.82			687	229.19		
1981-82	6,759	362.46	6,698	95.19	5,309	42.17	11,701	168.89			9,150	293.68			1,958	122.27	21,052	32.45
1982-83	9,822	244.92	7,448	82.98	8,478	26.28	11,701	128.07	9,615	208.20	8,741	318.47			1,567	169.74	25,397	40.26
1983-84	13,825	214.55	9,412	74.85	9,235	45.48	8,321	168.66	20,584	159.29	9,321	297.45			1,365	178.21	24,565	50.88
1984-85	18,250	182.16	12,302	42.62	10,129	48.06	6,944	209.35	42,214	87.96	7,775	370.51	1,591	88.04	1,698	152.57	30,420	48.87
1985-86	21,466	174.53	12,701	51.95	9,152	53.46	7,181	197.73	67,968	81.75	8,899	296.35	2,331	68.62	2,268	169.77	39,341	40.96
1986-87	22,743	168.84	12,822	58.53	11,054	45.76	7,838	198.08	78,123	60.30	8,783	314.96	1,602	143.36	2,376	160.51	41,554	48.13
1987-88	27,478	165.10	15,148	50.76	10,868	60.47	6,715	230.01	92,737	71.71	9,713	333.44	2,291	112.16	3,616	102.81		
1988-89	33,853	146.00			11,752	60.50	13,090	154.96	94,425	114.15	7,719	456.15	2,940	123.66	4,167	92.10		

INSTITUTE OF CORRESPONDENCE EDUCATION
UNIVERSITY OF MADRAS : MADRAS

The demand for higher education impelled the University of Madras to establish the Institute of Correspondence Education in 1981. This experiment, in the very first year of its operation (1981-82) itself attrcted about 15,000 students in various courses of study at the undergraduate levels. In the short span of 7 years, enrolment skyrocketted to a figure of 94,425 in 1988-89. Between 1983-84 and 1988-89, the rise of enrolment works out to be an annual average compound growth rate of 35.6 per cent -- a staggering figure indeed. The phenomenal growth of enrolment indicates that there is a heavy pent-up demand for higher education and as the supply constraint is removed, this pent-up demand rushes at high speed to fill up the supply. In terms of enrolment, ICE Madras has now become number one institute with the largest number of students enrolled in India.

Table 1: Growth of Enrolment in ICE, Madras

Year	Enrolment	Increase over the previous year (%)
1981-82	15,523	
1982-83	9,615	- 38.1
1983-84	20,584	+ 114.1
1984-85	42,214	+ 105.1
1985-86	67,968	+ 61.8
1986-87	78,123	+ 14.9
1987-88	92,737	+ 18.7
1988-89	94,425	+ 1.8

COURSES OF STUDY

The Institute is now offering the following courses of study:

Three Year Graduate Courses:

B. A. History (English and Tamil Medium)

B. A. Economics (English and Tamil Medium)

B. A. Psychology (English and Tamil Medium)

B. A. Tamil Literature

B. A. English Literature

B. A. Geography (English and Tamil Medium)

B. A. Indian Music (English and Tamil Medium)

B. Sc. Mathematics (English and Tamil Medium)

B. Com. (English and Tamil Medium)

Two Year Post-graduate Courses:

M. A. History (English and Tamil Medium)

M. A. Political Science (English Medium)

M. A. Public Administration (English Medium)

M. A. Defence Studies (English Medium)

M. A. Tamil Literature

M. A. English Literature

M. Com. (English Medium)

VOCATIONAL COURSES

Three months Certificate Courses in Library and Information Science (CLIS) (English and Tamil Medium)

One Year Bachelor's Degree Course in Library and Information Science (BLIS) (English Medium).

One Year Diploma in Geography (English and Tamil Medium)

Ph. D. Part-time

Part-time Ph.D. Programme is offered in English, History and Mathematics. There are 14 students registered for Ph.D.

OPEN UNIVERSITY SYSTEM:

The Open University System was introduced in the Institute in 1984 to provide University level continuing education to all those who are capable of it, irrespective of their previous academic qualification. Under this system, those who have completed 21 years of age as on 1st of June are admitted with an entrance test after undergoing preparatory course for about 100 hours.

The courses offered under this scheme are (1) Degree Course in History, Economics, Psychology, Tamil and English Literature, Indian Music, Mathematics and Commerce.

Credit System - One Year (Open University System only):

Candidates who do not want to register themselves for a Degree Course but wish to acquire knowledge in any particular paper are permitted to join and undergo the course prescribed therefor. On passing the exmination the candidates will be awarded a certificate of having earned one unit of credit. Candidates will thus be permitted to accumulate units of credits equal to the maximum number of written examinations prescribed for the branch of study for the Degree under the framework of the regulation prescribed therefore over a period of time and then awarded the degree concerned. But no candidate will be permitted to offer more papers than that prescribed for each year of study for the three year degree courses. In other words, each candidate will be required to spend not less than three years in the Institute, not necessarily consecutive to earn the degree.

The enrolment under Open University System was 40,326 in 1987-88.

The Institute has six Readers and Fifteen Lecturers. Apart from this, it uses the services of the Faculties in the University Departments and in Affiliated Colleges. The total number of teachers engaged by the Institute for specific purposes (like writing lessons, scrutinising lessons, taking class in the Personal Contact Programme, valuing the response sheets and answer papers) is about 1,800.

Detailed break-up of enrolment

A break-up of 1987-88 enrolment reveals that tthe out of the total enrolment of 92,737 students, undergraduate courses account for about 77 per cent of the enrolment, post-graduate coursee 22 per cent and barely 1.1 per cent of the students are admitted to the diploma coursee. In other words, the Institute has confined its activities to the conventional courses and has yet to take up non-conventional, innovative and applied courses.

The Open University System has attracted 40,326 students at the undergraduate level which accounts for 43.5 per cent of the total enrolment. It only indicates that there is a very heavy demand for obtaining a B.A. degree. This is evidenced by the fact that as against the regular formal stream with an enrolment of about 31,000 students, the Open University System has attracted over 40,000 students.

Classification of students on the basis of gender reveals that at the undergraduate level, 69 per cent students are males and 31 per cent are females. The proportion of males and females in the regular stream is 62:38 whereas in the Open University

System is 75:25. At the post-graduate level, the proportion of males and females is 65:35.

Table 2: Course-wise Distribution of Students in the ICE, Madras (1987-88)

	Male	Female	Total
Three year Undergraduate Course (Formal Stream)			
I Year	7,659	5,173	12,832
II Year	6,359	3,514	9,873
III Year	5,182	3,108	8,290
(i) Sub-total	19,200 (61.9)	11,795 (38.1)	30,995 (33.4) (100.0)
Three Year Undergraduate Course (Open University System)			
I Year	7,577	3,314	10,891
II Year	8,660	3,025	11,685
III Year	13,984	3,766	17,750
(ii) Sub-total	30,221 (74.9)	10,105 (25.1)	40,326 (43.5) (100.0)
Total Undergraduate (i + ii)	49,421 (69.3)	21,900 (30.7)	71,321 (76.9) (100.0)
Two Year Post-graduate Course			
I Year	7,205	3,989	11,194
II Year	5,936	3,249	9,185
(iii) Sub-total	13,141 (64.5)	7,238 (35.5)	20,379 (22.0) (100.0)
Diploma Courses (iv)	655 (63.2)	382 (36.8)	1,037 (1.1) (100.0)
Grand Total (i+ii+iii+iv)	63,217 (68.2)	29,520 (31.8)	92,737 (100.0) (100.0)

In an overall sense, it may be concluded that over two-third of the students are males and about one-third are females. Out of 92,737 students, males account for 63,217 and females were 29,520. A very significant proportion of females underlines the fact that a large number of women are taking advantage of the opportunities provided by distance education.

Staff students Ratio:

Table 3 and 4 indicates that total staff strength of the teaching and non-teaching staff. It is obvious that with a rapid increase in enrolment, neither teaching, nor non-teaching staff has increased proportionately. Consequently, there has been a deterioration both of the students and non-teaching staff ratio as also of the student-teacher ratio.

Table 3: Non-teaching Staff at ICE, Madras

Designation	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90
Senior Dy.Registrar	1	1	1	1	1	1
Dy. Registrar (Finance)	1	1	1	1	1	1
Asstt.Registrar	5	8	8	8	8	8
Superintendents	20	20	27	27	27	27
Assistant Jr.Assistant	87	128	179	179	179	179
Peon	71	71	71	71	71	71
Scavenger	4	4	4	4	4	4
Driver	2	1	2	2	2	2
Motor Cycle Messanger	1	1	1	1	1	1
Lift Operator	2	2	2	2	2	2
Tel. Operator	1	1	1	1	2	2
Sergeant	1	1	1	1	1	1
Watchman	4	4	4	4	4	4
Sweeper	4	4	4	4	4	4
Lib. Assistant	1	1	1	1	1	1
System Analyst	-	-	1	1	1	1
Application Programmer	-	-	3	3	3	3
Console Operator	-	-	3	3	3	3
Asstt.Librarian	1	1	1	1	1	1
Total	207	237	316	316	317	317

Table 4: Teaching Faculty at ICE, Madras

	1984-85	1985-86	1986-87	1987-88	1988-89
1. Director	1	1	1	1	1
2. Jt. Director	-	1	1	1	1
3. Dy. Director	2	2	2	2	2
4. Reader	7	7	7	7	7
5. Lecturer in Tamil	3	3	3	3	3
6. Lec. in English	3	3	3	3	3
7. Lec. in Economics	2	2	2	2	2
8. Lec. in History	4	4	4	4	4
9. Lec. in Maths.	1	1	1	1	1
10 Lec. in Commerce	2	2	2	2	2
11 Lec. in Public Administration	2	2	2	2	2
Total	27	28	28	28	28

The number of non-teaching staff increased from 207 in 1984-85 to 317 in 1988-89, whereas student enrolment increased from 42,214 to 94,245 during the same period. Consequently, non-teaching staff-students ratio deteriorated from 204:1 in 1984-85 to 297:1 in 1988-89. As against it, the virtual freezing of the teaching staff positions at 28 since 1985-86 has led to a sharp deterioration in student-teacher ratio. Whereas against one teacher, there were 1,563 students in 1984-85, the situation in 1988-89 has deteriorated fast and as against one teacher, there are 3,366 students. Evidently, even the requisite number of core-staff teachers recommended by the UGC are not provided in the ICE, Madras.

Table 5: Student-Staff Ratio in the Institute of Correspondence Courses, Madras

	1984-85	1985-86	1986-87	1987-88	1988-89
No. of students	42,214	67,968	78,123	92,737	94,245
Total non-teaching staff	207	237	316	316	317
Students-non-teaching staff ratio	204:1	287:1	247:1	293:1	297:1
Total teaching staff	27	28	28	28	28
Students-teacher ratio	1563:1	2427:1	2790:1	3312:1	3366:1

Cost Analysis of the Institute

The data about receipt and payment account of the Institute of Correspondence Courses have been taken from the Annual Reports of Madras University. The only source of receipt for the Institute are the fees from the students. On the expenditure side, the revenue account comprises of payment to staff (Teaching and Non-teaching), payment to lesson writers, teachers engaged for personal contact programme, postage, cost of printing and paper, expenditure connected with the conduct of examinations etc. All these payments are concerned with the current expenses of running the Institute.

Besides this,out of the surpluses generated from fees, the Institute was devoting a part for the creation of capital assets such as buildings and equipment. The entire mechanization of the administrative machinery has also been financed out of this surplus.

However, two major unusual expenditures were noticed while analysing the accounts which need special consideration. An item

"transfer to the Main University Office" appeared on the expenditure side. On enquiry, it was revealed that as per Tamil Nadu Government Order, 20 per cent of the total fee income had to be transferred to the University as a service charge. But since even the examinations of the students were conducted by the Institute of Correspondence Courses, no clue could be found for any tangible or material services rendered by the Madras University to the ICE which could justify the draining off such a large sum in the name of 'Service Charge'. It was also revealed that the State Government reduced its share of the grant to the extent of this transfer.

Another major drain on ICE was "Loan to the University". Although the item was shown as a loan, for all practical purposes it was a unilateral transfer which neither brought any interest to the ICE, nor was there any hope that Madras University would ever repay it or intends to repay it. Consequently, it was in the nature of a "drain" on the ICE to support the development programmes of the University.

The total fee income of the ICE for the period 1981-82 to 1988-89 aggregated to Rs. 2655.38 lakhs, but out of it, Rs. 873.89 lakhs was transferred to the University either as service charge or as loan. (Refer Table 6). This accounted for 32.9 per cent of total fee income. The Tamil Nadu Government encourages diversion of funds because it helps to reduce the quantum of grant that the State Government is required to pay to the University. Besides this, the ICE has created a fixed deposit of Rs. 420 lakhs which is 15.8% of total fee income. In other words, about 48% of the total fee income is being siphoned off for other purposes, rather than expanding Distance Education services.

TABLE 6: RECEIPTS AND PAYMENTS ACCOUNT OF THE INSTITUTE OF CORRESPONDENCE EDUCATION, MADRAS (IN RUPEES AT CURRENT PRICES)

	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89
1. TOTAL RECEIPTS FROM FEES	81,23,535	77,53,174	1,77,31,486	1,69,27,825	3,48,48,940	4,33,45,017	6,18,34,868	7,49,73,257
2. EXPENDITURE								
(i) REVENUE ACCOUNT	16,28,168	52,85,154	86,26,960	91,59,811	1,93,08,258	1,66,24,448	2,55,76,214	4,31,11,688
(ii) CAPITAL ACCOUNT			21,87,967	14,83,638	46,32,738	19,39,788	4,82,589	15,54,063
SUB-TOTAL (A)			1,08,14,920	1,06,14,942	2,39,40,996	1,85,64,236	2,60,58,803	4,46,65,749
(iii) TRANSFER TO MAIN UNIVERSITY OFFICE			27,00,000	29,94,647	69,28,507	1,77,22,847	1,11,05,698	1,37,20,119
(iv) NET LOAN TO THE UNIVERSITY			70,00,000	20,00,000	20,81,493	(-)65,00,000	54,00,000	2,22,37,000
(v) FIXED DEPOSIT							1,00,00,000	3,20,00,000
SUB-TOTAL (B)			97,00,000	49,94,647	90,10,000	1,12,22,847	2,65,05,698	6,79,57,119
TOTAL EXPENDITURE (A+B)			2,05,14,927	1,56,38,096	329,50,996	2,97,87,083	5,25,64,501	11,26,22,868
NO. OF STUDENTS	15,523	9,615	20,584	42,214	67,968	78,123	92,737	94,425
FEE INCOME PER STUDENT	523 (100.0)	806 (100.0)	861 (100.0)	401 (100.0)	513 (100.0)	555 (100.0)	667 (100.0)	794 (100.0)
EXPENDITURE PER STUDENT	105 (20.0)	550 (68.2)	525 (60.9)	251 (62.5)	352 (68.6)	238 (42.9)	281 (42.1)	473 (59.6)
SURPLUS PER STUDENT	418 (80.0)	256 (31.8)	150 (39.1)	150 (37.5)	161 (31.4)	317 (57.1)	386 (57.9)	321 (40.4)

Madras University encourages fast expansion of enrolment in ICE because the latter has become a fund raising source for the development plans of the University. In this process, the students seeking admission to ICE are required to pay higher fees in the Distance Education System to provide resources to the formal system, in all violation of the UGC guidelines that funds generated from Distance Education students should be exclusively used for expanding services for these students.

It was with this intention that in our calculation of unit costs, we have included revenue expenditure and capital expenditure and excluded Transfer of Funds to the University as a service charge or as loan. Since data for 1981-82 and 1982-83 includes some initial overheads, it would be more desirable to use the data for the period 1983-84 to 1988-89 as better indicator of the situation. This underlines the fact that instead of generating 32 to 40 per cent resources as surplus and fund the formal system, it would be more desirable to strengthen the quality of services being provided.

ENROLMENT AND COST PER STUDENT IN THE INSTITUTE OF CORRESPONDENCE COURSES, MADRAS

The Institute of Correspondence Courses, Madras is a case of very rapid growth of enrolment. Starting with an enrolment of 15,523 students in 1981-82, enrolment jumped to 67,968 in 1985-86 and then rose further to 94,425 in 1988-89. As against it, the cost per student which was Rs. 533.84 (at current prices) came down to Rs. 215.4 in 1986-87 and then rose to Rs. 456.6 in 1988-89.

A break-up of the various components of costs reveals that teaching staff salaries accounted for barely 1.7% of total

TABLE-7 INSTITUTE OF CORRESPONDENCE EDUCATION : UNIVERSITY OF MADRAS : MADRAS

COST OF EDUCATION PER STUDENT

(IN RS. AT CURRENT PRICES)

YEAR	ENROL	ACADEMIC SALARY	ACA COST PER STUD.	NON-ACA SALARY	NON-ACA COST PER STUD.	TOTAL SALARY	SALARY COST PER STUD.	OTHER CHARGES	OTHER COST PER STUD	TOTAL EXPEN.	TOTAL FEE INCOME	COST PER STUDENT	FEE INCOME PER STUD
1981-82	15,523	----	----	2,588,577 (16.5)	16.66	2,58,577 (16.5)	16.66	13,11,364 (67.0)	84.48	15,69,941 (100.0)	79,75,096	101.14	513.76 (307.9)
1982-83	9,615	----	----	10,72,012 (20.9)	111.49	10,72,012 (20.9)	111.49	40,60,866 (58.2)	422.35	51,32,878 (100.0)	77,25,076	533.84	803.44 (150.5)
1983-84	20,584	2,00,000 (3.1)	9.72	13,12,488 (14.0)	63.76	15,12,488 (16.1)	73.48	78,55,277 (69.9)	381.62	93,67,765 (100.0)	1,42,92,912	455.10	694.37 (152.6)
1984-85	42,214	6,56,057 (5.8)	15.54	17,64,103 (15.7)	41.79	24,20,160 (21.5)	57.33	88,31,790 (62.8)	209.21	1,12,51,950 (100.0)	1,67,31,096	266.54	396.34 (148.7)
1985-86	67,968	5,30,378 (2.9)	7.80	30,05,305 (16.8)	44.22	35,35,683 (19.7)	52.02	1,43,86,773 (63.5)	211.67	1,79,22,456 (100.0)	3,48,49,232	263.69	512.73 (194.4)
1986-87	78,123	6,80,696 (4.0)	8.71	41,00,364 (24.4)	52.49	47,81,060 (28.4)	61.20	1,20,43,388 (47.2)	154.16	1,68,24,448 (100.0)	4,33,45,017	215.36	554.83 (257.6)
1987-88	92,737	7,57,534 (3.0)	8.17	46,63,331 (18.2)	50.29	54,20,865 (21.2)	58.46	2,01,55,349 (60.0)	217.34	2,55,76,214 (100.0)	6,18,34,868	275.79	666.78 (241.8)
1988-89	94,425	7,49,311 (1.7)	7.94	60,19,950 (14.0)	63.75	67,69,261 (15.7)	71.69	3,63,42,425 (70.3)	384.88	4,31,11,686 (100.0)	7,49,73,257	456.57	794.00 (173.91)

Note: Other charges include:
1. Postage, 2, Advertisement, 3. Paper & Printing, 4. PCP classes, 5. Furniture, 6. Equipment,
7. Buildings and 8. Miscellaneous expenses (Taxes on Property,, Insurance, Telephone Charges etc.).

TABLE 8: INSTITUTE OF CORRESPONDENCE EDUCATION: UNIVERSITY OF MADRAS
(RS. AT CURRENT PRICES)

YEAR	POSTAGE	ADVERTI-SEMENT	PAPER & PRINTING	P.C.P.	FURNITURE/ EQUIPMENT/ BUILDING	OTHER MISC. CHARGES	TOTAL OTHER CHARGES
1981-82	98,000 (6.2)	1,68,145 (10.7)	6,02,342 (38.4)	74,164 (4.7)	2,87,774 (18.3)	80,939 (5.2)	13,11,364 (67.0)
1982-83	3,60,905 (7.0)	1,53,,848 (3.0)	23,02,393 (44.9)	3,38,827 (6.6)	3,69,882 (7.2)	5,35,001 (10.4)	40,60,866 (58.2)
1983-84	3,92,554 (4.2)	2,59,773 (2.8)	31,18,687 (33.3)	4,41,421 (4.7)	21,12,134 (22.5)	15,30,708 (16.3)	78,55,277 (69.9)
1984-85	4,60,007 (4.1)	3,97,383 (3.53)	25,59,118 (22.7)	7,47,776 (6.6)	29,02,197 (25.8)	24,38,308 (21.7)	88,31,790 (62.8)
1985-86	10,07,393 (4.3)	7,29,564 (4.1)	91,43,796 (51.0)	11,58,587 (6.5)	17,20,792 (9.6)	6,26,641 (3.5)	1,43,86,773 (63.5)
1986-87	7,62,560 (4.5)	10,52,784 (6.3)	54,57,577 (32.4)	15,03,562 (8.9)	10,90,534 (6.5)	21,66,371 (12.9)	1,20,43,388 (47.2)
1987-88	18,00,641 (7.0)	14,69,797 (5.7)	48,29,656 (18.9)	14,51,399 (5.7)	64,71,360 (25.3)	41,32,496 (16.1)	2,01,55,349 (60.6)
1988-89	25,47,504 (5.9)	20,90,280 (4.8)	98,41,718 (22.8)	16,17,150 (3.7)	1,43,86,873 (33.4)	58,58,900 (13.6)	3,63,42,425 (70.3)

NOTE: FIGURES IN BRACKETS ARE PERCENTAGES OF TOTAL EXPENDITURE AS GIVEN IN TABLE 7.

expenditure in 1988-89. Obviously the Institute is being run by a skeleton staff and bulk of the work is being arranged on piece-rates by hiring teachers of the regular system. The non-academic staff salaries accounted for barely 14 per cent of total expenditure. Taking teaching and non-teaching staff together, the salary component accounted for barely 15.7 per cent of total expenditure in 1988-89 (Refer table 7).

In contrast, other charges accounted for 70.3 per cent of total expenditure in 1988-89. A break-up of other charges into various heads is given in Table 8. The data reveal that paper and printing cost of reading materials accounted for 22.8 per cent of total expenditure. Another major item on which expenditure was incurred was furniture, equipment and buildings accounting for 33.4 per cent of total expenditure. This implies that nearly one-third of the total expenditure was incurred in creating infrastructure in terms of buildings and equipment.

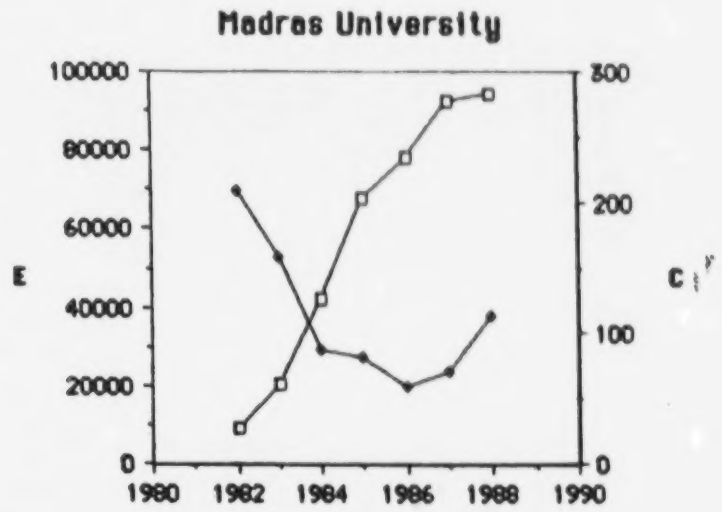
It may also be noted that throughout the 8-years of our study, fee income per student has been much higher than cost per student . Fee income was 153% of cost per student in 1983-84, it jumped to about 258% in 1986-87 and then came down to about 242% in 1987-88. Even in 1988-89, fee income was about 174% of cost per student. Obviously, Institute of Correspondence Education, Madras University is a surplus generating institution.

Data about costs per student at current prices was converted into costs at 1970-71 prices by using the deflator of consumer price index of non-manual employees. The following results were obtained:

Table 9: Enrolment and Cost per student at Institute of Correspondence Education, Madras

Year	Enrolment	Cost per student (Rs.)	
		At current prices	At 1970-71 prices
1981-82	15,523	101.14	
1982-83	9,615	533.84	208.20
1983-84	20,584	455.10	159.28
1984-85	42.214	266.54	87.96
1985-86	67,968	263.65	81.75
1986-87	78.123	215.36	60.30
1987-88	92.737	275.79	71.71
1988-89	94.425	456.57	114.15

Data about Institute of Correspondence Education, Madras University have been plotted on Graph I. The data clearly indicate that with rapid increase of enrolment, there is a decline in cost per student till the year 1986-87 and thereafter, an increase in costs has taken place.



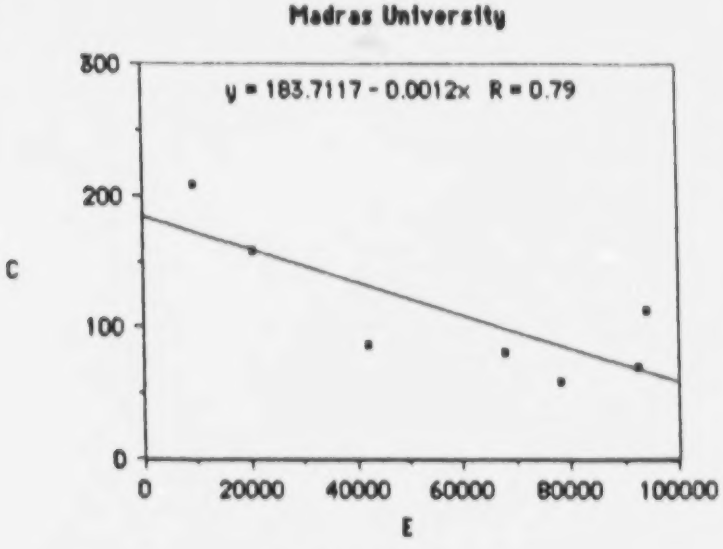
GRAPH I

In Graph II, we have presented the regression analysis between enrolment and unit costs. The analysis reveals the following:

Y = 183.7117 - 0.0012 X

R = -0.79

The analysis shows that there is a strong and negative correlation between enrolment and cost per student. This implies that ICE, Madras reaps the benefit of economies of scale in an abundant measure.



GRAPH II

DIRECTORATE OF DISTANCE EDUCATION
ANNAMALAI UNIVERSITY

Data about costs of distance education from the Directorate of Distance Education were obtained from the Budget Estimates of Annamalai University for a period of six years i.e. 1981-82 to 1986-87. Yearwise breakup of costs at current prices is given in table 1. Whereas separate figures of costs were given for a large number of courses, coursewise breakup of teaching cost was not given for foundation couse, B.A. (History), B.A. (Psychology), B.A. (Literature) and B.com. It was, therefore, decided to allocate the total teaching cost for these courses on a pro rata basis by the enrolment of students in these courses. Similarly, teaching cost for B.A.L. and Diploma in Law courses was given on a combined basis and thus was allocated on a pro rata basis of enrolment. However, other costs were separately provided for various heads for 5 years (1981-82 to 1985-86). Since the costs of distance education for 1986-87 did not give detailed break-down of costs, we have used the data for 1986-87 only to determine overall per student costs, but have not included it our detailed analysis of costs for different courses.

Relative shares of different components of costs

The relative shares of different components of costs are summarised in Table1 . A close perusal of the data reveals that academic cost which was only 22 per cent of total cost in 1981-82 rose to nearly 36 per cent in 1985-86 and then came down to about 31 per cent in 1986-87. As against it, the non-academic cost fell from 26.5 per cent in 1981-82 to about 19 per cent in 1986-87. In absolute terms, both academic and non-academic costs have shown an increase, but the rise in academic cost was

much higher. Probably this is due to the fact that in the early phase, due to a limited number of courses, academic staff positions were few and later as more and more courses were started, more academic staff positions were created and this led to a rise in academic cost.

Table 1: Share of different components of costs of distance education in Annamalai University

(Rs. at current prices)

	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87
1. Aca. cost	3,60,070 (22.1)	4,30,630 (16.4)	6,97,056 (19.5)	9,95,750 (22.1)	18,61,607 (35.8)	22,38,976 (31.3)
2. Non aca-cost	4,30,842 (6.5)	5,19,855 (19.8)	6,98,710 (19.6)	7,78,408 (17.3)	10,28,174 (19.8)	13,29,580 (18.6)
a. Total salary cost (1+2)	7,90,912 (48.6)	9,50,485 (36.2)	13,95,766 (39.1)	17,74,158 (39.4)	28,89,781 (55.6)	35,68,556 (49.9)
3. Lesson writing	1,03,250 (6.3)	95,325 (3.6)	46,747 (1.3)	42,860 (1.0)	52,609 (1.0)	63,787 (0.9)
4. Print. & Stat.	2,95,728 (18.2)	8,83,834 (33.7)	11,35,807 (31.8)	18,03,169 (40.0)	12,01,653 (23.1)	20,06,529 (28.1)
5.Personal contact programme	51,758 (3.2)	61,206 (2.3)	69,806 (2.0)	81,944 (1.8)	40,777 (0.8)	95,373 (1.3)
6. Library	25,703 (1.6)	27,497 (1.0)	1,13,818 (3.2)	56,957 (1.3)	63,754 (1.2)	1,88,199 (2.6)
7. Other Misc.	3,59,092 (22.1)	6,03,336 (23.0)	8,09,052 (22.7)	7,45,538 (16.6)	9,46,129 (18.2)	12,20,362 (17.1)
b. 3 to 7	8,35,531 (51.4)	16,71,198 (63.7)	21,75,230 (60.9)	27,30,468 (60.6)	23,04,922 (44.4)	35,74,250 (50.0)
Grand Total (a+b)	16,26,443 (100.0)	26,21,683 (100.0)	35,70,996 (100.0)	45,04,626 (100.0)	51,94,703 (100.0)	71,42,806 (100.0)

COST PER STUDENT

Aca.Cost	17.10	16.96	28.38	32.73	47.36	53.88
Non-aca Cost	20.47	20.47	28.44	25.59	26.15	32.00
a. Total Salary	37.57	37.43	56.82	58.32	73.51	85.88
Lesson Writing	4.90	3.75	1.90	1.41	1.34	1.54
Printing & Stationery	14.05	34.80	46.24	59.28	30.56	48.29
PCP	2.46	2.41	2.84	2.69	1.04	2.30
Library	1.22	1.08	4.63	1.87	1.62	4.53
Other Misc	17.06	23.76	32.94	24.51	24.07	29.37
b. 3 to 7	39.69	65.80	88.55	89.76	58.63	86.01
Grand Total	77.26	103.23	145.37	148.08	132.14	171.89

Note: Figures in brackets are percentages of total cost.

The other major component of cost is printing and stationery and cost of postage of reading materials (included under other miscellaneous expenses). These costs were of the order of 40 per cent in 1981-82 and increased to about 45 per cent in 1986-87.

A noteworthy feature of the cost structure is the very low level of expenditure on personal contact programme (PCP) which has shown a decline from 3.2 per cent in 1981-82 to 1.3 per cent in 1986-87. Need it be mentioned that the students consider PCP a very important input to assimilate learning. For this purpose, a decline in PCP costs is something which may be a cause of concern. Similarly, expenditure on library which can become a good source of enrichment to the students besides the reading materials, is another important input. This is more

so in view of the fact that a large number of post-graduate courses have been started. The reading materials cannot be comprehensive at this level and the need to supplement them by library support cannot be minimized. Library expenditure was only 1.6 per cent of total expenditure in 1981-82 and moved up slightly to 2.6 per cent in 1986-87.

Table 2: Sources of Income of Directorate of Distance Education Annamalai University

(Rs. at Current Prices)

	1981-82	1982-83	1983-84	1984-85	1985-86
1. Fee Income	57,41,297 (92.6)	1,19,41,031 (94.2)	1,25,59,727 (91.6)	1,77,38,178 (94.3)	2,31,83,665 (96.9)
2. Interest on invest.	4,57,509 (7.4)	6,81,582 (5.4)	9,05,057 (6.6)	10,70,653 (5.7)	7,37,223 (3.1)
3. Grant from UGC	----	50,000 (0.4)	2,50,000 (1.8)	----	----
Total	61,98,806 (100.0)	1,26,72,613 (100.0)	1,37,14,784 (100.0)	1,88,08,831 (100.0)	2,39,20,888 (100.0)
4. Enrolment (Number)	21,052	25,397	24,565	30,420	39,311
5. Fee income per student (1 ÷ 4)	272.27 (100.0)	470.17 (100.0)	511.29 (100.0)	583.11 (100.0)	589.75 (100.0)
6. Cost per student	77.26 (28.4)	103.23 (22.0)	145.37 (28.4)	148.08 (25.4)	132.08 (22.4)
7. Surplus per student (5-6)	195.01 (71.6)	366.94 (78.0)	365.92 (71.6)	435.03 (74.6)	457.67 (77.6)

FEE INCOME AND COST PER STUDENT

Table 2 provides information about fee income and cost per student in Directorate of Distance Education, Annamalai University. The data reveal that there are three sources of income -- (i) Fee income (ii) Interest on investments out of the savings from fee income and (iii) Grant from the UGC. In fact, interest on investments out of the savings

from fee income should legitimately be grouped under fee income realised from students. If this reasoning is considered valid, then income from student fees becomes the only source of income, let alone those years in which some UGC grant was available. Even if fee income as conventionally understood is considered, then it becomes evident that during the five year period cost per student as a percentage of fee income has ranged between 22 to 28 per cent. In other words, DDE Annamalai is a surplus generating institution and the surplus is being utilised either to provide infrastructures for the Directorate or to augment the general revenues of the University.

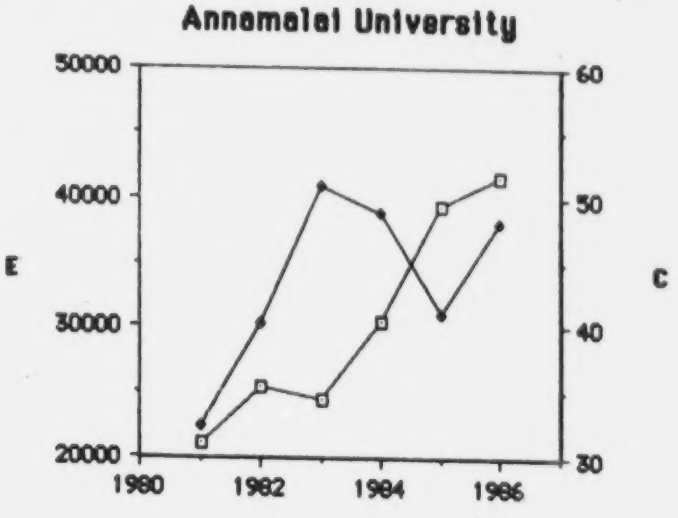
RELATIONSHIP BETWEEN COST PER STUDENT AND ENROLMENT.

From the data collected from the budget estimates of various years, cost per student for various years was derived at current prices. Using the linking factor, cost per student at 1970-71 prices was derived. The results are as under:

Table 3: Enrolment and Cost per student of Distance Education at Annamalai University.

Year	Enrolment	Cost Per Student (Rs)	
		At current prices	At 1970-71 prices
1981-82	21,052	77.26	32.45
1982-83	25,397	103.23	40.26
1983-84	24,565	145.37	50.88
1984-85	30,420	148.08	48.87
1985-86	39,311	132.14	40.96
1986-87	41,554	171.89	48.13

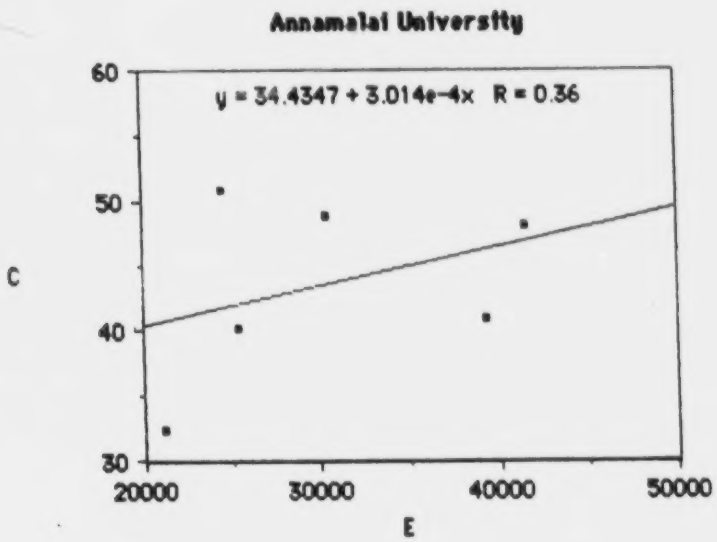
In Graph I, we present the trend of enrolment and cost per student at constant prices. But for the year 1985-86, in which cost per student has shown a decline, there is a persistent tendency for the costs to increase with an increase of enrolment. The co-efficient of correlation is +0.36 which indicates a positive, though weak correlation between enrolment and costs. This is contrary to the general hypothesis that distance education helps to reap the economies of scale and cost per student is likely to decline with an increase of enrolment.



The regression equation Y = a + bx yielded the following result for Annamalai University.

Y = 34.4347 + .0003 X

Obviously, the equation indicates a positive slope which implies that with increase of enrolment (X), Y has a tendency to increase, though the rate of increase is very very small.



SCHOOL OF CORRESPONDENCE COURSES & CONTINUING EDUCATION UNIVERSITY OF DELHI : DELHI - 110 007

Data about costs of distance education in the School of Correspondence Courses, University of Delhi have been collected for a period of 14 years i.e. 1975-76 to 1988-89. The data have been grouped under three main sub-heads: (i) Academic Staff Salary, (ii) Non-academic or supporting staff salary and (iii) Other expenditures. The data has been juxtaposed against enrolment. Besides this, data about fee income has also been tabulated so as to estimate the component of cost which is met by fee income.

A close perusal of table 1 reveals:

(i) At current prices, academic staff salary accounted for about 25 per cent of total costs during 1975-76 to 1977-78, but its share showed an increase thereafter. In some years, on account of revision of pay scales or payment of D.A. arrears, there was a sudden increase in the share of academic staff salaries to as high a figure as 36.3% in 1978-79 to 35.6% in 1982-83, but on the whole academic staff salaries fluctuated between 28 to 32 per cent of total costs.

(ii) Non-academic staff salaries have been fluctuating around 33 to 38 per cent of total, though there was an abnormal increase in 1983-84. This was due to promotions held up for a considerable period of time which led to the payment of heavy arrears.

(iii) The salary component (both academic and non-academic) accounted for 55 to 60 per cent of total costs, but it

increased thereafter and ranged between 64 to 70 per cent of total costs.

(iv) There has been a growth of "Other expenditures". This can be accounted for by various factors: (a) there was increase in the duration of personal contact programmes as also an improvement in remuneration paid to both academic and non-academic staff associated with PCP classes on sundays and holidays; (b) there was a rapid expansion of library facilities for students and this entailed larger allocations; (c) there was increase in cost of printing paper as well as cost of printing; and (d) there was increase in postal rate charges.

(v) Fee income contributed 72.3 per cent of total expenditure in 1975-76 at an enrolment level of 13,722. In subsequent years, fee income as a proportion of total expenditure continued to show a decline and was as low as 23.3 per cent in 1981-82 since enrolment fell to a pitiably low level of 6,759. Besides this, the School of Correspondence Courses also started granting fee concessions to poor students. This also resulted in decreasing the share of fee income in total expenditure, since enrolment showed a decline on account of (a) raising the eligibility condition for admission to 40 per cent of marks obtained at the Higher Secondary level and (b) switching over to 10+2 system of education. As the University decided to lower the eligibility and permitted all students who passed the Senior Secondry Examination (10+2), enrolment again picked up. The conversion of more and more schools to 10+2 system also helped in increasing a larger turn out at the 10+2 level.

Enrolment started picking up till it touched 22,743 in 1986-87. Consequent upon the increase in enrolment, there was virtually a very small increase in teaching staff, although some reasonable increase was permitted in non-academic staff to cope with the increase in workload. As a result, the contribution of fee to total expenditure improved till it touched about 55 per cent in 1988-89.

(vi) Data given in Table 2, reveal that with a rise in enrolment from 13,825 in 1983-84 to 33,833 in 1988-89, the number of teaching staff positions increased from 87 to 92 during this period. Consequently, student-teacher ratio showed a sharp increase from 159 : 1 in 1983-84 to 368 : 1. In other words, students-teacher ratio more than doubled during the period.

Similarly, non-academic staff positions increased from 220 in 1983-84 to 253 in 1988-89. While there was 145 per cent increase in enrolment during 1983-84 to 1988-89, non-academic positions increased by 15 per cent. In other words, students-non-academic staff ratio increased from 63 : 1 to 134 : 1.

(vii) Total cost per student showed an increase with a fall of enrolment during the period 1975-76 to 1981-82 and thereafter with an increase in enrolment, cost per student showed a decline even at current prices.

(viii) The element of subsidy per student increased as enrolment fell. Subsidy per student was only Rs. 83 in 1975-76, it rose to Rs. 273 in 1979-80 and shot up to a high figure of Rs. 662 in 1981-82. Thereafter with an increase in

enrolment, element of subsidy showed a decline and was Rs. 324 in 1984-85 and Rs. 264 in 1988-89.

Cost per Student at 1970-71 Prices

To eliminate the effect of inflation on costs, it was decided to convert cost per student with help of a linking factor with 1970-71 as the base using general price index for urban non-manual employees.

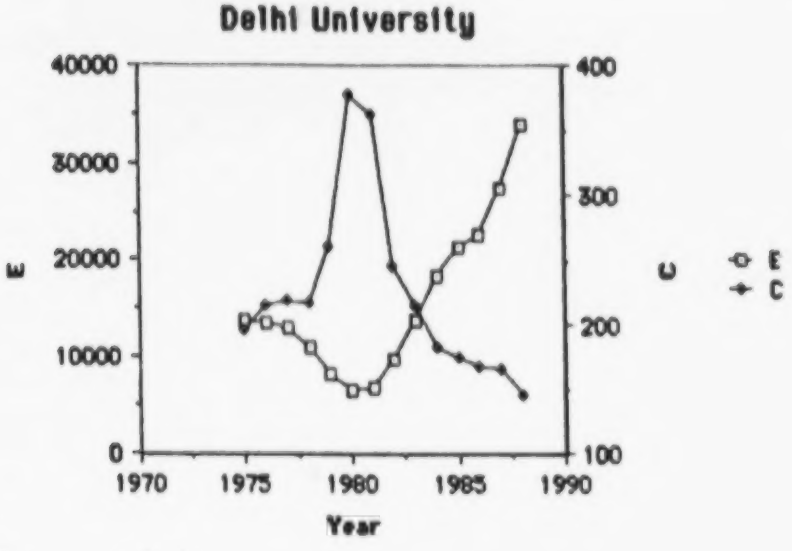
Table 3 presents the results of this exercise.

Table 3: Enrolment and Cost per Student in the School of Correspondence Courses & Continuing Education Delhi University

Year	Enrolment	Cost per student (Rs.)	
		At current prices	At 1970-71 prices
1975-76	13,722	311	195.93
1976-77	13,474	342	215.46
1977-78	13,203	370	218.30
1978-79	11,133	382	217.74
1979-80	8,355	493	261.29
1980-81	6,482	801	376.47
1981-82	6,759	863	362.46
1982-83	9,822	628	244.92
1983-84	13,825	613	214.55
1984-85	18,250	552	182.16
1985-86	21,466	563	174.53
1986-87	22,743	603	168.84
1987-88	27,478	635	165.10
1988-89	33,853	584	146.00

In Grpah I, we present the growth of enrolment and cost per student in the University of Delhi during 1975-76 to 1988-89. The graph shows clearly that as enrolment falls during the first six years (1975-76 to 1981-82), there is a sharp increase in cost per student which reaches its peak in

1981-82 and thereafter, as enrolment begins to rise, there is a continuous trend towards a decrease in costs.



The scatter diagram plotted in Graph II also shows that quite a good number of points lie along the regression line. Fitting the regression equation, $Y = a + bx$ in which x represents enrolment and y represents the cost per student. We find the following result for Delhi University:-

$Y = 331.9197 - 0.0068\ x$

The value of R =-0.80 and R2 = 0.64 indicates that the correlation between growth of enrolment and cost per student is negative and significant.

The upshot of the analysis is that in distance education, the economies of scale operate in the School of Correspondence Courses.

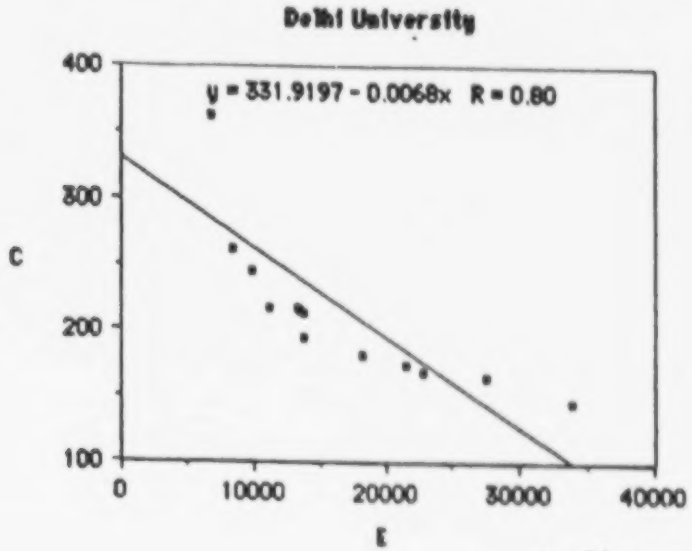


TABLE 1 : SCHOOL OF CORRESPONDENCE COURSES & CONTINUING EDUCATION: UNIVERSITY OF DELHI: DELHI.

COST OF EDUCATION PER STUDENT

IN RS. AT CURRENT PRICES

YEAR	ENROL.	ACADEMIC SALARY	ACA. COST P/STU	NON-ACA SALARY	NONACA COST P/STU	TOTAL SALARY	SALARY PER STUD.	OTHER EXPEN.	OTHER CHAR. P/STU	TOTAL FEE INCOMME	TOTAL EXPEND.	COST PER STUD.	INCOME PER STUD.	SUBSIDY PER STUDENT
1975-76	13,722	10,78,758 (25.3)	78.62	14,75,945 (34.6)	107.56	25,54,703 (59.9)	186.18	17,13,342 (40.1)	124.86	31,28,616	42,68,045 (100.0)	311	228 (72.3)	83
1976-77	13,474	11,88,093 (25.8)	88.18	13,36,404 (28.9)	99.19	25,24,497 (54.7)	187.36	20,87,195 (45.3)	154.91	28,16,066	46,11,692 (100.0)	342	209 (61.1)	133
1977-78	13,263	12,13,972 (24.9)	91.95	14,66,006 (30.0)	111.04	26,79,978 (54.9)	202.99	22,05,132 (45.1)	167.02	32,21,532	48,85,110 (100.0)	370	244 (65.9,)	126
1978-79	11,133	13,36,081 (31.4)	120.01	14,62,329 (34.4)	131.35	27,98,410 (65.8)	251.37	14,52,554 (34.2)	130.48	19,92,807	42,50,964 (100.0)	382	179 (46.9)	203
1979-80	8,355	14,96,510 (36.3)	179.12	15,47,472 (37.5)	185.22	30,43,982 (73.8)	364.33	10,78,684 (26.2)	129.11	18,38,100	41,22,666 (100.0)	493	220 (44.6)	273
1980-81	6,482	15,70,054 (30.2)	242.22	20,69,599 (39.9)	319.29	36,39,653 (70.1)	561.51	15,54,814 (29.9)	239.87	14,51,968	51,94,467 (100.0)	801	224 (28.0)	577
1981-82	6,759	18,70,035 (32.1)	276.68	21,60,100 (37.0)	319.59	40,30,135 (69.1)	596.27	18,01,906 (30.9)	266.60	13,58,559	58,32,041 (100.0)	863	201 (23.3)	662
1982-83	9,822	21,99,155 (35.6)	223.90	23,98,324 (38.9)	244.18	45,97,479 (74.5)	468.08	15,71,002 (25.5)	159.95	22,59,060	61,68,481 (100.0)	628	230 (36.6)	398
1983-84	13,825	21,35,078 (25.2)	154.44	38,28,097 (45.2)	276.90	59,63,175 (70.4)	431.34	25,06,273 (29.6)	181.29	35,80,675	84,69,448 (100.0)	613	259 (42.2)	354
1984-85	18,250	31,44,190 (30.7)	172.29	35,98,015 (35.2)	197.16	67,42,205 (65.9)	369.44	34,87,700 (34.1)	191.11	42,34,000	102,29,90 (100.0)	552	232 (42.0)	320
1985-86	21,466	36,71,272 (30.4)	171.03	40,22,148 (33.3)	187.38	76,93,420 (63.7)	358.41	43,86,191 (36.3)	204.34	60,96,344	120,79,61 (100.0)	563	284 (50.4)	279
1986-87	22,743	39,32,523 (28.7)	172.92	48,15,052 (35.1)	211.72	87,47,575 (63.8)	384.63	49,62,175 (36.2)	218.19	68,45,643	137,09,75 (100.0)	603	301 (49..9)	302
1987-88	27,478	62,21,591 (35.7)	226.42	58,54,062 (33.5)	213.05	1,20,75,653 (69.2)	439.47	53,64,408 (30.8)	195.23	84,32,042	174,40,06 (100.0)	635	307 (48.3)	328
1988-89	33,853	61,04,483 (30.9)	180.33	65,89,027 (33.3)	194.64	1,26,93,510 (64.2)	374.96	79,86,992 (35.8)	209.35	108,32,960	197,80,50 (100.0)	584	320 (54.8)	264

TABLE 2

SCHOOL OF CORRESPONDENCE COURSES AND CONTINUING EDUCATION
UNIVERSITY OF DELHI : DELHI

(IN RS. AT CURRENT PRICES)

YEAR	NO. OF STUDENTS	NO. OF TEACH. STAFF	STU/ACA STAFF RATIO	SALARY OF TEACHING STAFF	PER ACA STAFF SALARY	NO. OF NON-ACA STAFF	STUDENT/ NON-ACA STAFF RATIO	SALARY FOR NON-ACA STAFF	PER NON-ACA STAFF SALARY
1983-84	13,825	87	159:1	21,35,078	24541.13	220	63:1	38,28,097	17400.44
1984-85	18,250	89	205:1	31,44,190	35327.98	220	83:1	35,98,015	16354.61
1985-86	21,466	89	241:1	36,71,272	41250.25	220	98:1	40,22,148	18282.49
1986-87	22,743	89	255:1	39,32,523	44185.65	232	98:1	48,15,052	20754.53
1987-88	27,478	92	299:1	62,21,591	67625.99	232	118:1	58,54,062	25233.00
1988-89	33,853	92	368:1	61,04,483	66353.08	253	134:1	65,89,027	29950.12

DIRECTORATE OF DISTANCE EDUCATION
UNIVERSITY OF BOMBAY

Data about cost of distance education was collected for the 10-year period (1978-79 to 1987-88). The data reveal that in the Directorate of Distance Education, Bombay enrolment declined from 12,054 in 1978-79 to just 5,280 in 1980-81 and thereafter, it started picking up and reached the peak of 15,148 in 1987-88. As a consequence of steep fall in enrolment during 1978-79 to 1980-81, the cost per student which was just Rs. 124.51 in 1978-79 more than doubled to Rs. 290.19 in 1980-81. As enrolment started picking up cost per student continued to decline upto 1984-85 till it reached the low level of Rs. 129.13 in 1984-85. But in the subsequent years, the rapid increase in cost per student was mainly the result of a sharp increase in salary expenditure of non-academic staff. This was due to increase in non-academic staff with increase of enrolment as also due to increase resulting from revision of pay scales. Another factor contributing towards increase in costs was the rapid increase in the cost of printing paper, stationery and postage charges. The per capita expenditure on these items which was just Rs. 26.35 in 1984-85 shot up to Rs. 59.82 in 1987-88 (Refer table 1). It may, however, be mentioned that since Bombay University did not have any permanent academic staff in the Directorate of Distance Education and got all the work done by the academics on a hiring basis, academic cost did not rise sharply.

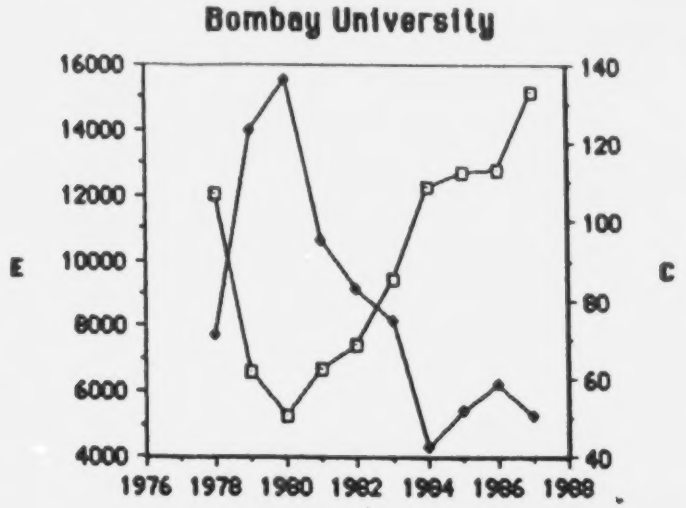
To adjust the cost per student at current prices for rise in prices, the linking factor based of consumer price index of non-manual employees with base 1970-71 was used. As a consequence, cost per student worked out as under:-(Refer Table 2):

Table 2: Enrolment and Cost per student in the Directorate of Distance Education, Bombay.

Year	Enrolment	Cost Per Student (Rs)	
		At Current prices	At 1970-71 prices
1978-79	12,054	124.51	70.97
1979-80	6,585	232.65	123.31
1980-81	5,280	290.19	136.39
1981-82	6,698	226.64	95.19
1982-83	7,448	212.75	82.98
1983-84	9,412	213.85	74.85
1984-85	12,302	129.13	42.62
1985-86	12,701	167.58	51.95
1986-87	12,822	209.02	58.53
1987-88	15,148	195.21	50.76

Enrolment and Cost per student at 1970-71 prices have been presented in Graph I. The graph clearly indicates an inverse relationship between enrolment and cost per student.

GRAPH I

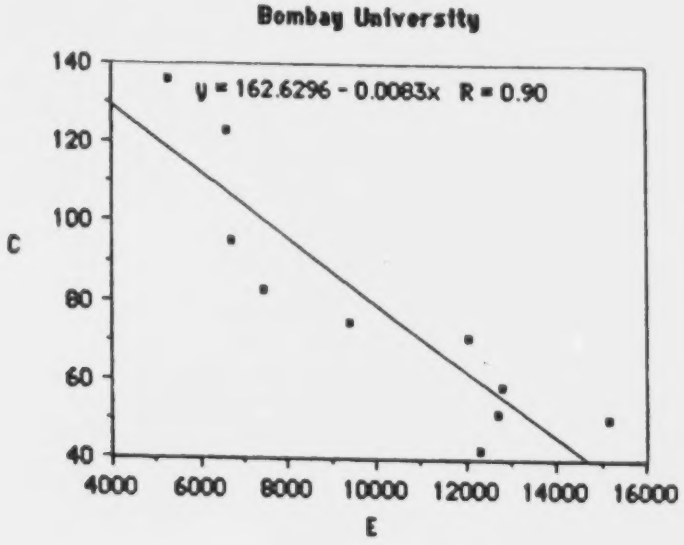


The regression equation between enrolment (X) and cost per student (Y) yielded the following result:

Y = 162.6296 - 0.0083 X

R = -0.90

The value of R shows that the inverse relationship between enrolment and cost per student is negative and is also very significant. In other words, Directorate of Distance Education, Bombay University was able to effectively reap the economies of scale.



GRAPH-II

TABLE .

DIRECTORATE OF DISTANCE EDUCATION : UNIVERSITY OF BOMBAY : BOMBAY
COST OF EDUCATION PER STUDENT

(IN RS. AT CURRENT PRICES)

YEAR	ENROL.	ACA.COST	ACA. COST PER STUD.	NON-ACA. SALARY	NON ACA. COST PER/STU	TOTAL SALARY	SALARY PER STUD.	PRTG/ STATION PAPER & POSTAGE	PS/P&P PER STUD.	OTHER CHARGES	OTHER COST PER STUD	TOTAL EXPEND.	COST PER STUD.
1978-79	12,054	4,51,700 (30.1)	37.47	3,34,900 (22.3)	27.78	7,86,600 (52.4)	65.26	6,03,100 (40.2)	50.03	1,11,100 (7.4)	9.22	15,00,800 (100.0)	124.51
1979-80	6,585	6,27,700 (41.0)	95.32	4,02,700 (26.3)	61.15	10,30,400 (67.3)	156.48	3,65,400 (23.9)	55.49	1,36,220 (8.9)	20.69	15,32,020 (100.0)	232.65
1980-81	5,280	4,83,600 (31.6)	91.59	4,67,800 (30.5)	88.60	9,51,400 (62.1)	180.19	4,70,000 (30.7)	89.02	1,10,797 (7.2)	20.98	15,32,197 (100.0)	290.19
1981-82	6,698	5,34,200 (35.2)	79.76	4,91,900 (32.4)	73.44	10,26,100 (67.6)	153.19	4,05,800 (26.7)	60.58	86,141 (5.7)	12.86	15,18,041 (100.0)	226.64
1982-83	7,448	5,03,700 (31.7)	67.63	5,71,300 (36.1)	76.71	10,75,000 (67.8)	144.33	3,96,300 (25.0)	53.21	1,13,272 (7.1)	15.21	15,84,572 (100.0)	212.75
1983-84	9,412	5,05,800 (25.1)	53.74	6,41,300 (31.9)	68.14	11,47,100 (57.0)	121.88	8,11,900 (40.3)	86.26	53,800 (2.7)	5.72	20,12,800 (100.0)	213.85
1984-85	12,302	5,01,300 (31.6)	40.75	6,73,900 (42.4)	54.78	11,75,200 (74.0)	95.53	3,24,100 (20.4)	26.35	89,278 (5.6)	7.26	15,88,578 (100.0)	129.13
1985-86	12,701	7,67,700 (36.1)	60.44	8,16,200 (38.3)	64.26	15,83,900 (74.4)	124.71	4,91,200 (23.1)	38.67	53,400 (2.5)	4.20	21,28,500 (100.0)	167.58
1986-87	12,822	6,52,200 (24.3)	50.87	9,69,601 (36.2)	75.62	16,21,801 (60.5)	126.49	7,65,100 (28.5)	59.67	2,93,120 (10.9)	22.86	26,80,021 (100.0)	209.02
1987-88	15,148	6,33,700 (21.5)	41.83	10,41,686 (35.2)	68.77	16,75,386 (56.7)	110.60	9,06,200 (30.6)	59.82	3,75,475 (12.7)	24.79	29,57,061 (100.0)	195.21

DIRECTORATE OF CORRESPONDENCE COURSES
HIMACHAL PRADESH UNIVERSITY : SHIMLA

Data about cost per student were available for 10 years i.e. 1979-80 to 1988-89 for the Directorate of Correspondence Courses, Himachal Pradesh University, Shimla. From Table 1, an analysis of the various components of costs reveals the following:

1. Academic cost formed only about 17 per cent of total cost in 1979-80, but it increased to about 34 per cent in 1983-84 and again came down to about 31 per cent in 1988-89. The rise in the proportion of academic cost is largely due to diversification of courses and an increase in staff positions.

2. Non-academic salary accounted for 19.3 per cent of total cost in 1979-80 but its share increased to 38.5 per cent in 1987-88 and thereafter declined to 34.2 per cent in 198-89.

3. The component of salary cost (Academic plus Non-academic) accounted for 36.2 per cent of total cost in 1979-80 but it rose to 72 per cent in 1982-83 and thereafter, it ranged between 65 to 69 per cent (Refer Table 1).

4. Fee income accounted for about 50 per cent of total expenditure during 1979-80 and 1980-81. Thereafter, fee income declined to about 44 per cent of total expenditure in 1984-85. However, as enrolment began to increase, fee income

as a proportion of total expenditure showed an increase and was about 65 per cent in 1988-89.

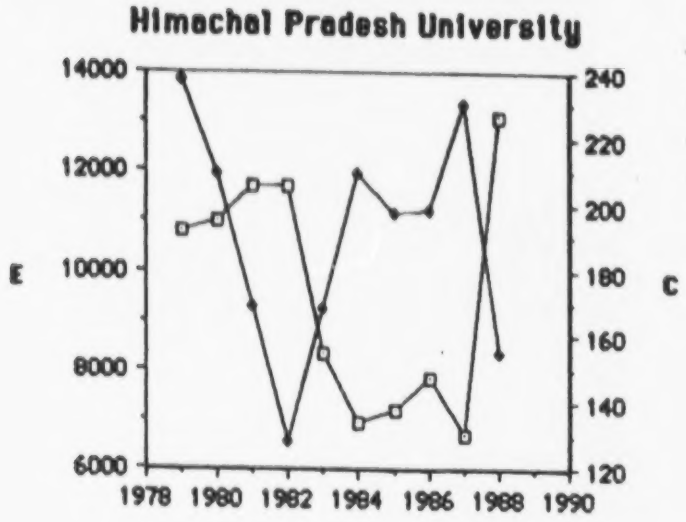
Data about cost per student of Himachal Pradesh University, Directorate of Correspondence Courses, indicating fluctuations with rise and fall of enrolment are given in Table 2:

Table 2: Enrolment and Cost per student in Directorate of Correspondence Courses, Himachal Pradesh University, Shimla

Year	Enrolment	Cost Per Student (Rs)	
		At current prices	At 1970-71 prices
1979-80	10,830	448.07	237.48
1980-81	11,042	445.72	209.49
1981-82	11,701	402.10	168.89
1982-83	11,701	328.38	128.07
1983-84	8,321	481.86	168.66
1984-85	6,944	634.38	209.35
1985-86	7,181	637.82	197.73
1986-87	7,838	707.41	198.08
1987-88	6,715	884.64	230.01
1988-89	13,090	619.84	154.96

In Graph I, the relationship between enrolment and cost per student (at 1970-71 prices) has been presented. The graph indicates an inverse relation between enrolment and cost per student.

GRAPH I



For this propose, regression analysis was conducted between Enrolment (X) and cost per student (Y). The regression equation for the Directorate of Correspondence Courses, Himachal Pradesh University was as under:

$$Y = 262.4679 - 0.0076\ X$$

The value of R = -0.52 indicated a negative correlation, though it is not very significant.

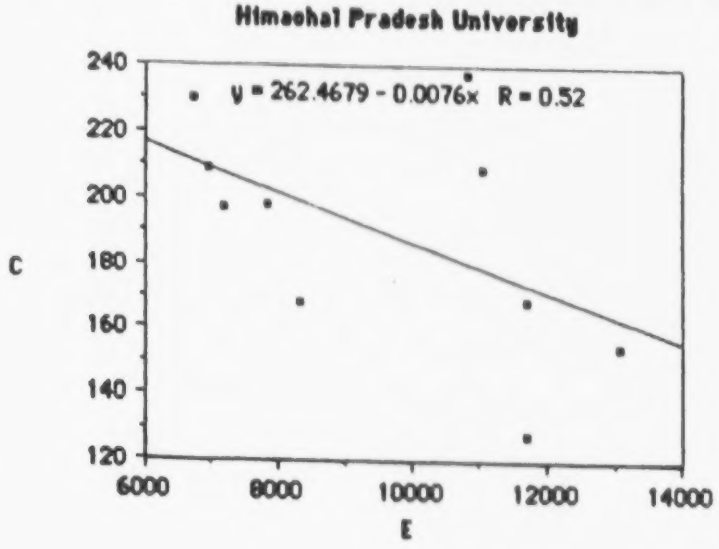


TABLE 1

DIRECTORATE OF CORRESPONDENCE COURSES: HIMACHAL PRADESH UNIVERSITY: SHIMLA

COST OF EDUCATION PER STUDENT

(IN RS. AT CURRENT PRICES)

YEAR	ENROL.	ACADEMIC SALARY	ACA. COST PER STUD.	NON-ACA. SALARY	NON-ACA COST PER STUD.	TOTAL SALARY	SALARY COST PER STUD	OTHER CHARGES	OTHER COST PER STUD	TOTAL EXPENDI.	TOTAL FEE INCOME	COST PER STUD	INCOME PER STUDENT
1979-80	10,830	8,20,794 (16.7)	75.79	9,37,447 (19.3)	86.56	17,58,241 (36.2)	162.35	30,94,386 (63.8)	285.72	48,52,627 (100.0)	23,71,770	448.07	219.00 (48.9)
1980-81	11,042	9,68,465 (19.7)	87.71	9,84,486 (20.0)	89.16	19,52,951 (39.7)	176.87	29,68,650 (60.3)	268.85	49,21,601 (100.0)	24,40,282	445.72	221.00 (49.6)
1981-82	11,701	10,41,891 (22.1)	89.04	11,34,862 (24.2)	96.99	21,76,753 (46.3)	186.03	25,28,237 (53.7)	216.07	47,04,990 (100.0)	21,29,582	402.10	182.00 (45.3)
1982-83	11,701	13,19,390 (34.3)	112.76	14,52,283 (37.8)	124.12	27,71,673 (72.1)	236.87	10,70,707 (27.9)	91.51	38,42,380 (100.0)	17,19,345	328.38	146.94 (44.7)
1983-84	8,321	13,47,015 (33.6)	161.88	14,47,374 (36.1)	173.94	27,94,389 (69.7)	335.82	12,15,160 (30.3)	146.04	40,09,549 (100.0)	16,76,931	481.86	201.53 (41.8)
1984-85	6,944	13,81,199 (31.4)	198.91	16,46,028 (37.3)	237.04	30,27,227 (68.7)	435.95	13,77,897 (31.3)	198.43	44,05,124 (100.0)	19,19,322	634.38	276.40 (43.6)
1985-86	7,181	14,64,599 (32.00)	203.95	16,55,167 (36.2)	230.49	31,19,766 (68.2)	434.45	14,56,815 (31.8)	202.87	45,76,581 (100.0)	27,33,448	637.82	380.65 (59.7)
1986-87	7,838	16,43,295 (29.6)	209.66	17,79,129 (32.1)	226.99	34,22,424 (61.7)	436.65	21,22,301 (38.3)	270.77	55,44,725 (100.0)	31,80,974	707.41	405.84 (57.4)
1987-88	6,715	16,25,543 (27.4)	242.08	22,90,945 (38.5)	341.17	39,16,488 (65.9)	583.25	20,23,805 (34.1)	301.39	59,40,343 (100.0)	37,34,816	884.64	556.19 (62.9)
1988-89	13,090	25,11,151 (30.9)	191.84	27,72,339 (34.2)	211.79	52,83,490 (65.1)	403.63	28,30,209 (34.9)	216.21	81,13,699 (100.0)	52,88,360	619.84	404.00 (65.2)

DEPARTMENT OF CORRESPONDENCE COURSES & DISTANCE EDUCATION S.N.D.T. WOMEN'S UNIVERSITY : BOMBAY

Data on enrolment and costs were available for SNDT Women's University for a 10-year period i.e. 1979-80 to 1988-89. Break-up of the various components of costs were available for five year 1984-85 to 1988-89. The data reveal that enrolment picked up from 1,980 students in 1979-80 to 10,129 in 1984-85 and thereafter, it has failed to grow at the rapid pace at which it was growing during the earlier quinquennium. By 1988-89, enrolment was around 11,752 indicating a growth of 16.0 per cent period during 1984-85 to 1988-89 -- an annual average growth rate of 3.01 per cent.

Analysis of costs reveals that academic cost which was 10.9 per cent of total cost in 1984-85 declined to 4.6 per cent in 1988-89. Similarly, non-academic salary cost declined from 31.6 per cent in 1984-85 to 28.5 per cent in 1988-89. Thus, the total salary component of costs in SNDT Women's University has declined from 42.5 per cent in 1984-85 to 33.1 per cent in 1988-89.

The other major component of cost is cost of printing, stationery, paper and postage. All these costs are related to the production of reading materials and their despatch to the students. These costs accounted for about 53 per cent of total unit costs in 1984-85 but rose further to 60.5 per cent in 1988-89.

The other costs i.e., cost of organization of personal contact programme, student support services, like library-cum-study centres accounted for a very small proportion of the total costs, ranging between 4 to 6 per cent (Refer Table 1).

In all the 10-year of our study, fee income was much higher than total expenditure and consequently, the surplus per student was Rs. 144 in 1979-80 and was around Rs. 111 per student in 1984-85 and about Rs. 99 in 1988-89. The upshot of the analysis is that the expenditure has been deliberately kept low and surpluses are generated. Even the fee income realised from the students is not spent fully to expand student services and thus improve the quality of distance education.

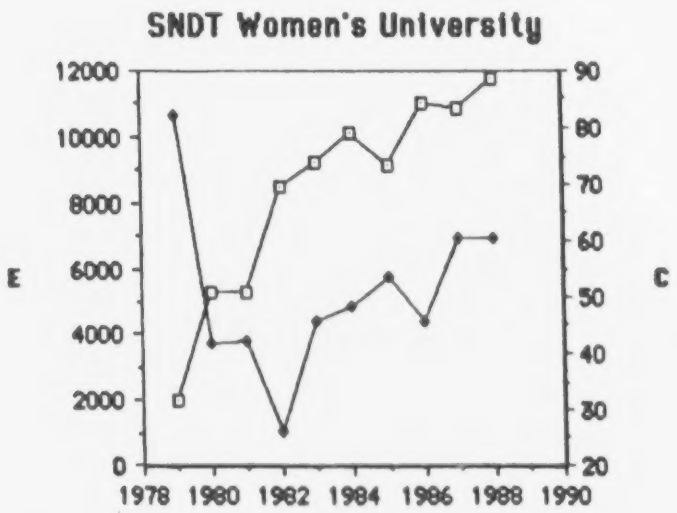
Unit costs at current prices have been converted into unit costs at constant (1970-71) prices. As a result, the following picture emerges:

Enrolment and Cost per student at SNDT Women's University, Bombay

Year	Enrolmment	Cost per student	
		At current prices	At 1970-71 prices
1979-80	1,980	155.15	82.23
1980-81	5,329	89.23	41.94
1981-82	5,309	100.39	42.17
1982-83	8,478	67.38	26.28
1983-84	9,235	129.94	45.48
1984-85	10,129	145.61	48.06
1985-86	9,152	172.43	53.46
1986-87	11,054	163.43	45.76
1987-88	10,868	232.57	60.47
1988-89	11,752	242.00	60.50

In Graph I, enrolment and cost per student have been represented. There is decline in cost per student noticed during the period 1979-80 to 1982-83. The cost per student touched a low level of Rs. 26 (at 1970-71 prices), thereafter, the cost per student has continuously shown an uptrend.

GRAPH I

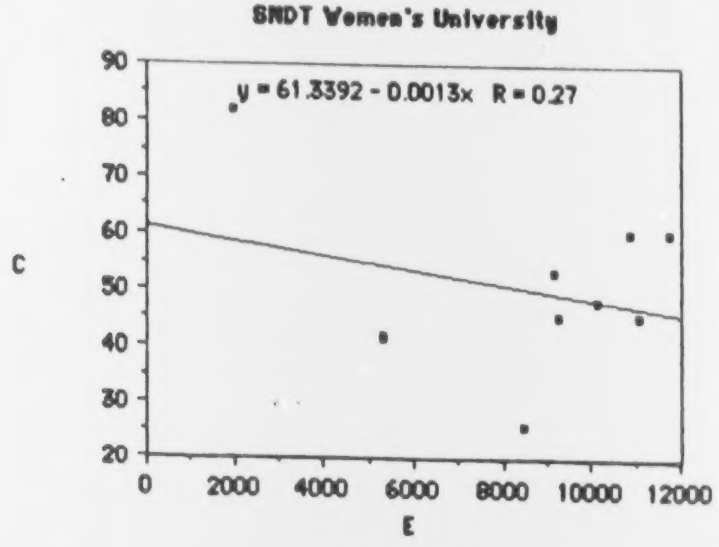


The regression equation fitted between enrolment and cost per student yielded the following result:

$Y = 61.3392 - 0.0013X$

$R = -0.27$

The regression equation shows a negative, but very weak correlation between enrolment and cost per student. scatter diagram in Graph II also does not signify any clear trend. This may be due to no clear cut policy regarding the provision of both teaching and non-teaching staff and student support services followed by the Institute. The approach seems to be to incur minimum expenditure and thus generate savings which may be used either to enhance the general revenues of the University or to create infrastructures for distance education students.



GRAPH II

TABLE 1

DEPARTMENT OF CORRESPONDENCE COURSES & CONTINUING EDUCATION, S.N.D.T. WOMEN'S UNIVERSITY, BOMBAY
COST OF EDUCATION PER STUDENT
(IN RS. AT CURRENT PRICES)

YEAR	ENROL.	ACA. COST	ACA COST PER/STU	NON-ACA SALARY	NON-ACA COST PER/STU	TOTAL SALARY	SALARY PER STU	PRINT. STAT. PAP/POST.	PS/P&P PER STUD.	OTHER CHARGES	OTHER COST PER/STU	TOTAL EXPEN.	TOTAL FEE INCOME	COST PER STUD.	INCOME PER STUDENT
(1)	(22)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
1979-80	1,980											3,07,198 (100.0)	5,92,812	155.15	299.40 (192.9)
1980-81	5,229											4,75,510 (100.0)	13,20,366	89.23	247.77 (277.6)
1981-82	5,309											5,33,000 (100.0)	15,02,978	100.39	283.10 (282.0)
1982-83	8,478											5,71,246 (100.0)	15,65,971	67.38	184.71 (273.7)
1983-84	9,235											12,00,000 (100.0)	16,50,017	129.94	178.67 (137.5)
1984-85	10,129	1,61,000 (10.9)	15.89	4,66,200 (31.6)	46.03	6,27,200 (42.5)	61.92	7,80,900 (52.9)	77.09	67,787 (4.6)	6.59	14,74,837 (100.0)	25,96,063	145.61	256.30 (176.0)
1985-86	9,152	1,35,900 (8.6)	14.85	5,31,000 (33.7)	58.03	6,67,000 (42.3)	72.88	8,21,675 (52.1)	89.78	89,495 (5.6)	9.78	15,78,170 (100.0)	23,19,117	172.43	253.40 (146.9)
1986-87	11,054	1,06,445 (5.9)	9.63	5,63,200 (30.9)	50.95	6,69,745 (36.8)	60.58	10,83,600 (59.6)	98.03	64,320 (3.6)	5.82	18,17,565 (100.0)	27,93,899	163.43	252.75 (153.7)
1987-88	10,868	1,26,900 (5.0)	11.68	6,73,500 (26.7)	61.97	8,00,400 (31.7)	73.65	16,07,900 (63.6)	147.95	1,19,800 (4.7)	10.98	25,27,600 (100.0)	35,08,190	232.57	322.80 (138.0)
1988-89	11,752	1,32,200 (4.6)	11.25	8,09,300 (28.5)	68.86	9,41,500 (33.1)	80.11	17,20,800 (60.5)	146.43	1,81,800 (6.4)	15.47	28,44,100 (100.0)	40,04,964	242.00	340.79 (140.8)

Notes:
a. 1979-80 to 1983-84 Break-up not available.
b. Figures aim brackets are percentage of total expenditure
c. Figures in brackets in Col. 16 are percentage of fee income to cost per student ((16 ÷ 15)x100).

69

70

DIRECTORATE OF CORRESPONDENCE COURSES

PANJAB UNIVERSITY, CHANDIGARH

Data for enrolment and cost per student for Directorate of Correspondence Courses, Panjab University, Chandigarh were available for a period of 11 years i.e. 1978-79 to 1988-89.

The data reveal that total enrolment was 10,011 in 1978-79, it gradually declined to 8,741 by 1982-83, it again picked up to 9,321 in 1983-84 and declined thereafter. Again in 1987-88, enrolment touched 9,713 and then fell to 7,719. In other words, during the 11 year period, there have been fluctuations in enrolment in the range of 7,700 to 10,000. It is difficult in such a situation to reduce costs since teaching staff and administrative staff positions cannot be adjusted to fluctuations of enrolment. Secondly, with a relatively small enrolment in undergraduate courses, the Directorate had to impart instruction in three media viz., English, Hindi and Panjabi. This also increased cost of preparation of reading materials and printing of lessons. Moreover, the Directorate conducted 13 courses, out of which undergraduate courses comprised of Pre-University, B.A. and B.Com. The enrolment in these courses is too small to reap the economies of scale. The existence of three media further adds to costs. 7 courses are being conducted at the post-graduate level, i.e. English, Economics, History, Political Science, Public Administration, Hindi and Panjabi. Besides these, there are three diploma courses in Office Organisation and Procedures, Statistics and Population Education. Enrolment in these courses has been in the range of 40 to 200 which is too small. (Refer Table 1).

TABLE 1

ENROLMENT IN VARIOUS COURSES IN THE DIRECTORATE OF CORRESPONDENCE COURSES, PANJAB UNIVERSITY, CHANDIGARH

COURSE	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89
1. PRE-UNIV.	1,183	1,037	1,007	1,131	786	1,163	695	883	325
2. B.A.	3,824	3,927	3,756	3,821	3,331	3,775	4,399	4,636	3,130
3. B.COM.	892	921	930	928	633	824	876	716	502
UNDER-GRADU. (1 TO 3)	5,899 (62.4)	5,885 (64.3)	5,693 (65.1)	5,880 (63.1)	4,750 (61.1)	5,762 (64.7)	5,970 (67.9)	6,235 (64.2)	3,957 (51.3)
4. M.A. ENG.	912	903	721	950	715	807	669	717	807
5. M.A. ECO.	648	508	571	547	454	426	377	470	445
6. M.A. HIST	267	255	198	213	178	201	163	194	220
7. M.A.POL.SC.	334	265	274	326	279	287	272	264	312
8. MA PUB.ADMN	824	777	798	814	763	686	571	716	825
9. M.A. HINDI	217	228	209	245	243	318	352	428	455
10.M.A.PUNJABI	152	127	111	180	205	230	274	332	444
(B) POST-GRAD. (4 TO 10)	3,354 (35.4)	3,063 (33.4)	2,862 (33.0)	3,273 (35.1)	2,837 (36.5)	2,955 (33.2)	2,681 (30.5)	3,121 (32.1)	3,508 (45.4)
11.DIP.IN OFFICE ORGN.& PROCEDURES	207	202	166	---	----	---	132	110	116
12. DIP. IN STATISTICS	------	----	-----	---	----	---	---	177	102
13. DIP. IN POPU-LATION EDU.	----	----	-----	---	----	---	---	70	36
(C) DIPLOMA COURSE (11 TO 13)	207 (2.2)	202 (2.2)	166 (1.9)	166 (1.8)	186 (2.4)	182 (2.1)	132 (1.5)	357 (3.7)	254 (3.3)
TOTAL	9,460 (100.0)	9,150 (100.0)	8,741 (100.0)	9,321 (100.0)	7,775 (100.0)	8,899 (100.0)	8,783 (100.0)	9,713 (100.0)	7,719 (100.0)

SOURCE: ANNUAL REPORTS, DIRECTORATE OF CORRESPONDENCE COURSES, PANJAB UNIVERSITY, CHANDIGARH

Data given in Table 2 indicate the various components of costs in DCC, Panjab University. It may be noted that over the years, academic salary component which was 30.2 per cent of total cost in 1978-79 has gone up to 38.5 per cent in 1988-89. Similarly, the non-salary component has also shot up from 25.3 per cent in 1978-79 to 37.8 per cent in 1988-89. Taken together, the total salary component has gone up from 55.5 per cent in 1978-79 to 76.3 per cent in 1988-89.

Several factors seem to have contributed to the situation. Firstly, with a diversification of courses and activities associated with the organisation of distance education, the staff strength, both academic and non-academic, has been increased over the years. Secondly, senior faculty positions of Readers and Professors have been sanctioned to number of teacners in the directorate. As a consequence, the average pay of the teacher has shot up. Thirdly, the revision of pay scales under the impact of the recommendations of the Fourth Pay Commission has also resulted in a sharp increase in salary component of total. All this has led to salary cost per stude : shooting up from Rs. 305 in 1978-79 to Rs. 1,398 in 1988-89. As against it, the rate of increase in 'other cost' per student has been relatively much less. The other cost per student rose from Rs. 245 in 1978-79 to Rs. 434 in 1988-89.

It may noted that although fee income per student has gone up from Rs. 341 in 1978-79 to Rs. 601 in 1988-89, cost per student has shown a much greater jump from Rs. 549 to Rs. 1,833 during the same period. Consequntly, the share of fee income in total expenditure has been progressively declining; it was 62% of total expenditure in 1978-79, it come down to about 50% in 1982-

Table 2: DIRECTORATE OF CORRESPONDENCE COURSES, PANJAB UNIVERSITY, CHANDIGARH

COST OF EDUCATION PER STUDENT

IN RS. AT CURRENT PRICES

YEAR	ENROL	ACADEMIC SALARY	ACA. COST P/STU	NON-ACA SALARY	NON-ACA COST P/STU	TOTAL SALARY	SALARY COST P/STU	OTHER CHARGES	OTHER COST P/STU	TOTAL EXPENDITURE	TOTAL FEE INCOME	COST PER STUD.	FEE INCOME PER STUD.
1978-79	10,011	16,39,552 (30.2)	165.77	13,90,028 (25.3)	138.85	30,49,580 (55.5)	304.62	24,48,467 (44.5)	244.58	54,98,047 (100.0)	34,16,354	549.20 (100.0)	341.26 (62.1)
1979-80	9,101	17,06,007 (31.6)	187.45	14,67,899 (27.2)	161.29	31,73,906 (58.8)	348.74	22,23,695 (41.2)	244.34	53,97,601 (100.0)	34,64,933	593.08 (100.0)	380.72 (64.2)
1980-81	9,460	19,20,831 (28.9)	203.05	20,32,821 (30.6)	214.89	39,53,652 (59.5)	417.93	26,84,728 (40.5)	283.80	66,38,380 (100.0)	36,00,098	701.73 (100.0)	380.56 (54.2)
1981-82	9,150	21,89,703 (34.2)	239.31	20,09,073 (31.4)	219.57	41,98,776 (65.6)	458.88	21,99,159 (34.4)	240.35	63,97,935 (100.0)	36,43,439	699.23 (100.0)	398.19 (56.9)
1982-83	8,741	23,23,045 (32.5)	265.76	26,18,011 (36.7)	299.51	49,41,056 (69.2)	565.27	21,96,711 (30.8)	251.31	71,37,767 (100.0)	35,49,196	816.58 (100.0)	406.04 (49.7)
1983-84	9,321	26,47,012 (33.4)	283.98	29,27,042 (36.9)	314.03	55,74,054 (70.3)	598.01	23,47,264 (29.7)	251.83	79,21,318 (100.0)	38,31,117	849.84 (100.0)	411.02 (48.4)
1984-85	7,775	27,26,395 (31.2)	350.66	32,81,153 (37.6)	422.01	60,07,548 (68.8)	772.67	27,21,733 (31.2)	350.06	87,29,281 (100.0)	34,71,771	1,122.74 (100.0)	446.53 (39.8)
1985-86	8,899	28,99,534 (34.1)	325.83	32,55,299 (38.3)	365.81	61,54,833 (72.4)	691.63	23,52,326 (27.6)	264.34	85,07,159 (100.0)	41,18,635	955.96 (100.0)	462.82 (48.4)
1986-87	8,783	35,57,194 (36.0)	405.00	35,35,296 (35.8)	402.52	70,92,490 (71.8)	807.52	27,86,900 (28.2)	317.31	98,79,390 (100.0)	43,37,317	1,124.83 (100.0)	493.55 (43.9)
1987-88	9,713	39,05,916 (31.4)	402.13	43,34,488 (34.8)	446.26	82,40,404 (66.2)	848.39	42,15,884 (33.8)	434.05	1,24,56,288 (100.0)	54,16,940	1,282.43 (100.0)	557.70 (43.5)
1988-89	7,719	54,46,362 (38.5)	705.60	53,45,868 (37.8)	692.56	1,0792,430 (76.3)	1398.16	33,53,412 (23.7)	434.44	1,41,45,842 (100.0)	46,42,438	1,832.60 (100.0)	601.43 (32.8)

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83 and was at a low level of about 33% in 1988-89. The Directorate of Correspondence Courses, Panjab University, Chandigarh is thus a deficit institution and the element of state subsidy in cost per student was Rs. 207 in 1978-79, but has significantly risen to Rs. 1,231 per student in 1988-89. (Refer Table 2).

Table 3: Staff Strength of the Directorate of Correspondence Courses, Panjab University, Chandigarh

	1985-86	1986-87	1987-88	1988-89
Teaching staff	122	122	122	122
Non-teaching staff	220	221	220	210
No. of students	8,899	8,783	9,713	7,719
Students-Teacher Ratio	72.9:1	72.0:1	79.6:1	63.3:1
Students-Non-teaching staff ratio	40.5:1	39.7:1	44.2:1	35.1:1

Directorate of Correspondence Courses, Panjab University, Chandigarh has a very large contingent of teaching staff of 122 persons. Despite the fact that enrolment came down to 7,719, the number of members of the teaching faculty was maintained at the previous level. As a result, the student-teacher ratio is highly favourable at DCC, Chandigarh. While this ratio was 73:1 in 1985-86, it came down to 63:1 in 1988-89.

Similar is the position with regard to non-teaching staff. The ratio of students-to-non-teaching staff was 41:1 in 1985-86 and it came down to 35:1 in 1988-89. Such a favourable student-staff ratio was not available in any of distance education institutions in the country. Consequently, this factor is bound

to push up cost per student. (For details of teaching and non-teaching staff, Refer tables 5 and 6).

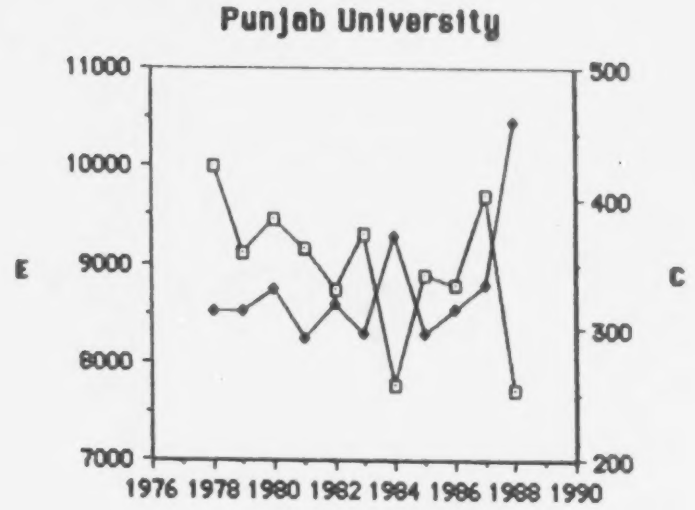
Cost per student was calculated at current prices and then by using the deflator of consumer price index of non-manual employees, cost per student at 1970-71 was derived. (Refer Table 4).

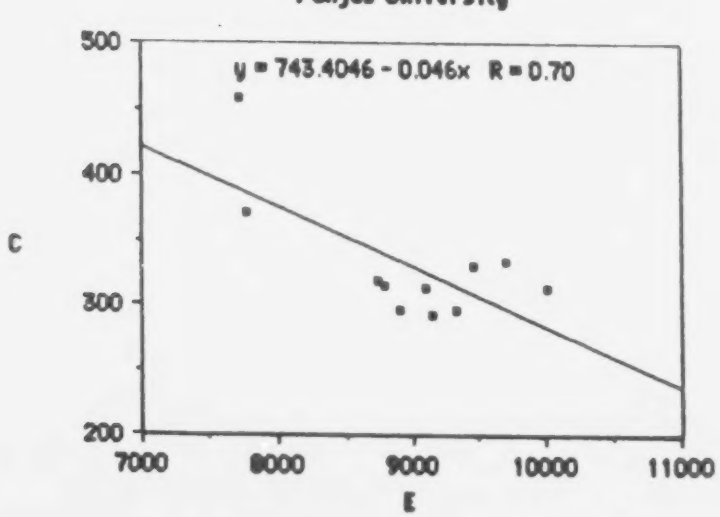
Table 4: Enrolment and Cost per student in the Directorate of Correspondence Courses, Panjab University, Chandigarh

Year	Enrolment	Cost per student	
		At current prices	At 1970-71 prices
	(X)		(Y)
1978-79	10,011	549.20	313.05
1979-80	9,101	593.08	314.34
1980-81	9,460	701.73	329.82
1982-83	8,741	816.58	318.47
1981-82	9,150	699.23	293.68
1983-84	9,321	849.84	297.45
1984-85	7,775	1,122.74	370.51
1985-86	8,899	955.96	296.35
1986-87	8,783	1,124.83	314.96
1987-88	9,713	1,282.43	333.44
1988-89	7,719	1,832.60	458.15

In Graph I, the relationship between enrolment and cost per student has been presented. The Graph indicates an inverse relationship between enrolment and unit costs. A sharp decline of enrolment in 1984-85 and again in 1988-89 has led to an escalation of unit costs.

GRAPH I





GRAPH II

Regression equation between enrolment (X) and cost per student (Y) yielded the following result.

$Y = 743.4046 - 0.046X$

$R = -0.70$

Regression equation indicates negative correlation between enrolment and cost per student and also shows that the correlation is significant.

Table 5: Directorate of Correspondence Courses
Panjab University, Chandigarh

Academic Staff	1985-86	1986-87	1987-88	1988-89
Director	1	1	1	1
Professors	4	4	4	6
Readers	29	34	34	43
Lecturers	75	69	69	56
Tutor-cum-curators	5	5	5	5
Research Officers	2	2	2	2
Translators	6	6	6	6
Cartographer	1	1	1	1
Total	122	122	122	122

Table 6: Directorate of Correspondence Courses
Panjab University: Chandigarh

Administration & supporting staff	1985-86	1986-87	1987-88	1988-89
1. Dy. Registrar	1	1	1	1
2. Asstt. Registrar	2	2	2	2
3. Superintendents	4	4	4	8
4. Librarian (Lib.Asstt)	1	1	1	-
5. Asstt. Librarian	4	4	4	4
6. Receptionist-cum-Library Clerk	1	1	1	1
7. Library Clerk	1	1	1	1
8. Care-taker-cum-Recep.	1	1	1	1
9. Restorers	3	3	3	3
10. Binder	1	1	1	1
11. Library Attendant	2	2	2	2
12. Cartographers	1	1	1	1
13. Production Assistant	1	1	1	1
14. Statistician	1	1	1	1
15. Technician	1	1	1	1
16. Draftsman	1	1	1	1
17. Attendants (Lab)	2	2	2	2
18. Proof-Readers	6	6	6	6
19. Copyholders	6	6	6	6
20. Personal Assistant	1	1	1	1
21. Stenographers	3	3	3	3
22. Steno-typists	5	5	5	5
23. Assistants	26	26	23	34
24. Clerks	78	79	78	56
25. Telephone Operator	1	1	1	1
26. Receptionist	1	1	1	1
27. Lesson Keeper	2	2	2	2
28. Lift Operator	1	1	1	1
29. Driver	1	1	1	1
30. Gestetner Operators	3	3	3	3
31. File Lifters	2	2	2	2
32. Malis	2	2	2	2
33. Chowkidars	4	4	4	4
34. Cleaners	4	4	4	4
35. Daftries	14	14	14	14
36. Peons	26	26	26	25
37. Waterman	1	1	1	1
38. Frash	1	1	1	1
39. Jr. Technician	-	-	-	1
40. Asstt. Electronic Engg	-	-	-	1
CELL TO DEAL WITH THE WORK OF MAINTAINING SEPARATE ACCOUNTS OF THE DIRECTORATE				
Assistant	1	1	1	1
Clerks	5	5	5	5
Peon	1	1	1	1
Total	220	221	220	210

INSTITUTE OF CORRESPONDENCE COURSES

PATNA UNIVERSITY, PATNA

Data about Institute of Correspondence Courses, Patna was available for 10 years i.e. 1979-80 to 1988-89. The enrolment in the Institute has gradually increased from 523 in 1979-80 to 1,698 in 1984-85 and to 4,167 in 1988-89. Detailed break-up of the cost was not available, but total expenditure and fee income figures were available. Cost per student was very low in 1981-82, i.e. Rs. 291 at current prices, but as the staff positions were sanctioned and the activities were diversified, costs began to rise, but a rapid increase in enrolment in 1987-88 and 1988-89 again brought down costs from the peak reached in 1986-87 to Rs. 573 to Rs. 368.4 in 1988-89 (Refer Table 1).

As against it, fee income per student has been generally higher than cost per student. But for the year 1985-86, in which fee income was 76.2% of cost per student, fee income has invariably been higher than cost per student. In other words, Institute of Correspondence Courses, Patna has been a surplus generating institution. (Refer table 1).

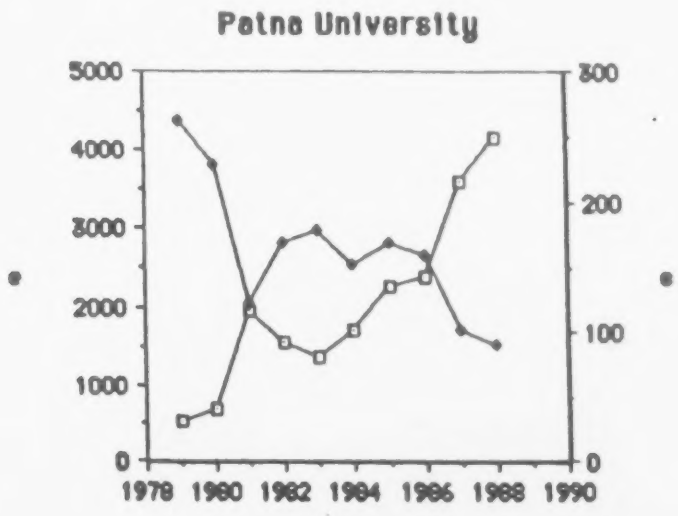
Since these costs were at current prices, they were converted into costs per student at 1970-71 prices by using the consumer price index of non-manual employees as the deflator. The results are tabulated in table 2.

Table 2

Enrolment and Cost per student in the Institute of Correspondence Courses, Patna

Year	Enrolment	Cost per student	
		At current prices	At 1970-71 prices
	(X)		(Y)
1979-80	523	497.13	263.48
1980-81	687	487.63	229.19
1981-82	1,958	291.11	122.27
1982-83	1,567	435.23	169.74
1983-84	1,365	509.16	178.21
1984-85	1,698	462.31	152.57
1985-86	2,268	547.62	169.77
1986-87	2,376	573.23	160.51
1987-88	3,616	394.63	102.61
1988-89	4,167	368.37	92.10

In Graph 1, we have presented data between enrolment and cost per student at 1970-71 prices. The graph indicates a clear negative correlation between enrolment and cost per student.



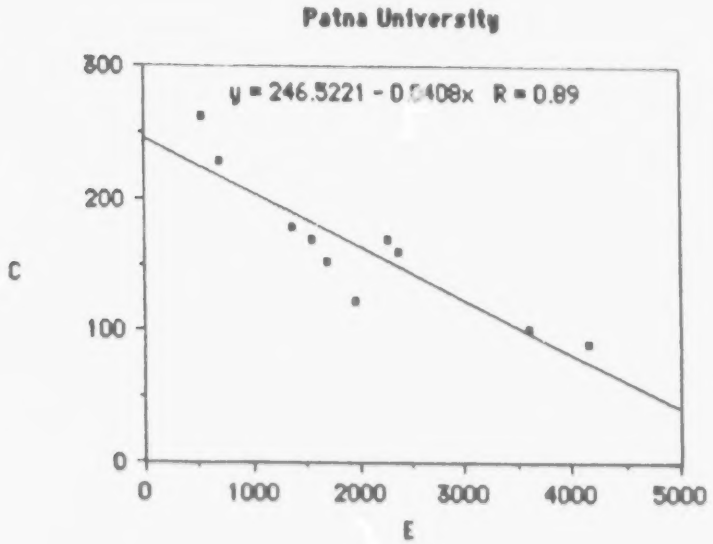
GRAPH I

In Graph II, we present the regression line and this also indicates a declining slope with increase of enrolment. The regression equation between Enrolment (X) and cost per student (Y) yielded the following results:

Y = 246.5221 - 0.0408X

R = -0.89

The analysis shows that correlation between enrolment and cost per student was negative and highly significant.



GRAPH II

TABLE 1
INSTITUTE OF CORRESPONDENCE COURSES
PATNA UNIVERSITY

(IN RS. AT CURRENT PRICES)

COST OF EDUCATION PER STUDENT

YEAR	ENROL-MENT	TOTAL INCOME FEE (RS. IN LAKHS)	EXPEN-DITURE (IN LAKHS)	COST PER STUD. (RS)	FEE INCOME PER STUDENT (RS)	FEE INCOME AS % OF COST PER STUDENT
1979-80	523	3.20	2.60	497.13	611.85	123.1
1980-81	687	8.00	3.35	487.63	474.24	97.2
1981-82	1,958	8.55	5.70	291.11	436.67	150.0
1982-83	1,567	9.80	6.82	435.23	625.40	143.6
1983-84	1,365	7.00	6.95	509.16	512.82	100.7
1984-85	1,698	12.48	7.85	462.31	734.98	159.0
1985-86	2,268	9.47	12.42	547.62	417.55	76.2
1986-87	2,376	11.81	13.62	573.23	497.05	86.7
1987-88	3,616	15.96	14.27	394.63	441.37	111.8
1988-89	4,167	18.64	15.35	368.37	447.32	121.4

INSTITUTE OF CORRESPONDENCE COURSES & CONTINUING EDUCATION X
ALLAHABAD UNIVERSITY : ALLAHABAD

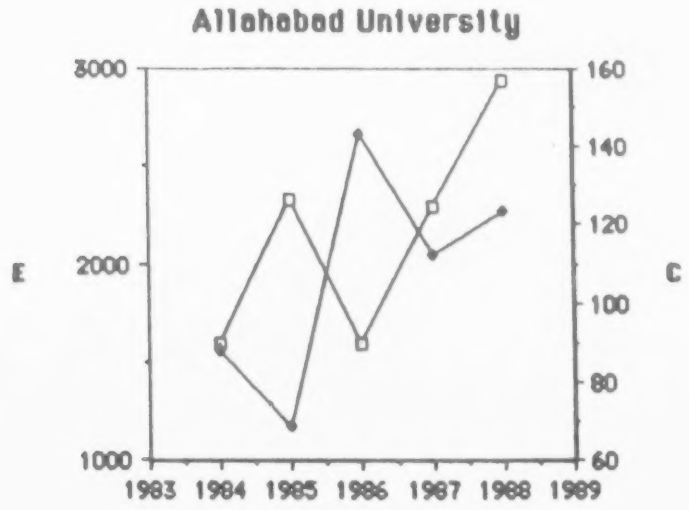
Data about the Institute of Correspondence Courses & Continuing Education, Allahabad was available only for 5 years viz., 1984-85 to 1988-89. The strange feature of the Allahabad Institute is the complete absence of teaching faculty in the Institute. The entire work of preparation of Reading Materials is done by experts drawn from the University on a system of payment decided by the University. Consequently, academic staff cost has been shown as nil. The philosophy behind the working of the Institute is to run it either on a self-financing basis or a surplus earning institute. Thus, costs have been kept deliberately depressed. In four years out of the five included here, fee income was much higher than total expenditure. During the five years, total surplus accruing to the Institute aggregated to Rs. 6,23,627. Obviously, the University and the State Government appear to be of the view that there is no need to provide help to the Institute to improve the quality of distance education since the Institute is able to generate surplus year after year. (Refer Table 1).

Cost per student at current prices was converted by a linking factor into cost per student at constant prices (1970-71 prices). The result of the exercise is as under:

Table 2: Enrolment and cost per student in Institute of Correspondence Courses and Continuing Education, Allahabad.

Year	Enrolment	Cost Per Student (Rs)	
		At current prices	At 1970-71 prices
1984-85	1,591	266.77	88.04
1985-86	2,331	221.35	68.82
1986-87	1,602	511.98	143.36
1987-88	2,291	431.37	112.16
1988-89	2,940	494.61	123.66

The data was plotted on a graph. This showed absence of any trend. Absence of trend may also be due to the fact that the fluctuations in enrolment may be a contributory factor. Secondly, the number of observations being too small, and range of enrolment is between 1,591 to 2,940, a trend may not become clearly discernable (See Graph 1).



GRAPH I

Regression equation fitted to the data yielded the following result.

$Y = 111.1468 - 0.0018\ X \qquad R = 0.04$

There is a very weak negative correlation which is insignificant. The value of R is too low to merit any consideration.

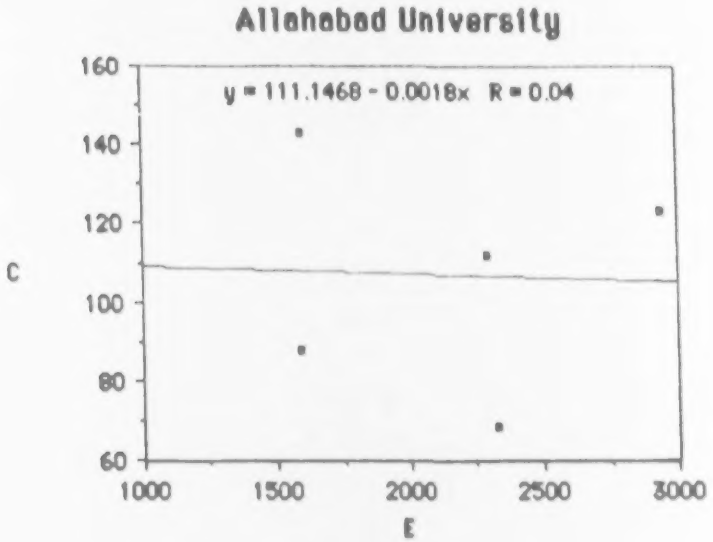


TABLE 1

INSTITUTER OF CORRESPONDENCE COURSES & CONTINUING EDUCATION: ALLAHABAD

(IN RS. AT CURRENT MPRICES)

YEAR	ENROL	COST OF EDUCATION PER STUDENT									
		ACA. SALARY	NON-ACA SALARY	NON-ACA COST PER STU	TOTAL SALARY	OTHER EXPEN	OTHER COST PER STUD.	TOTAL EXPEN	TOTAL FEE INCOME	COST PER STUD.	FEE INCOME PER STU.
1984-85	1,591	----	2,33,434 (55.0)	146.72	2,33,434 (55.0)	1,90,991 (45.0)	120.04	4,24,425 (100.0)	3,55,036	266.77	348.86 (130.8)
1985-86	2331	----	2,85,485 (55.3)	122.47	2,85,485 (55.3)	2,30,491 (44.7)	98.88	5,15,976 (100.0)	9,40,698	221.35	403.56 (182.3)
1986-87	1602	----	4,53,267 (55.3)	282.93	4,53,267 (55.3)	3,66,934 (44.7)	229.05	8.20,201 (100.0)	8,76,582	511.98	547.18 (106.9)
1987-88	2291	----	6,93,416 (70.2)	302.67	6,93,416 (70.2)	2,94,853 (29.8)	128.70	9,88,269 (100.0)	11,74,648	431.37	512.81 (118.91)
1988-89	2940	---	9,65,796 (66.4)	328.50	9,65,796 (66.4)	4,88,364 (33.6)	166.11	14.54,160 (100.0)	12,79,494	494.61	435.20 (88.0)

Note: Figures in brackets are percentage to total expenditure

89

POOLED REGRESSION ANALYSIS

Distance Education institutions work in different environments. It has been pointed out that some institutions have been deliberately pursuing policies of keeping costs low so as either to meet their expenditure within fee income or generate surpluses so as to augment the general revenues of the universities. These institutions either do not employ any faculty or work with a skeleton staff and get the entire work of lesson writing done on a hiring basis. The emphasis is not on producing quality reading materials, but just on producing **some** reading materials. Similarly, the organization of student support services like counselling, conduct and duration of personal contact programmes, library-cum-study centres, checking of student assignments, production of audio and video-cassettes etc. is either not undertaken, or just a modicum of such services are provided. As against them, there are other institutions which have a larger teaching faculty, better organised student support services and thus, as years have rolled by, enrichment of services has taken place. As a consequence, with enlargement of size, some institutions have reaped economies of scale in a much greater degree than others. This is evident from the regression analysis conducted for nine institutions earlier. The b co-efficients of the nine distance education institutions have shown a wide range of variation. The b co-efficient was a low as +0.0003 in the case of Annamalai to as high as -0.046 in the case of Panjab. Among distance education institutions which showed high co-efficients were Panjab (-0.046), Patna (-0.0408), Bombay (-0.0083), Himachal Pradesh (-0.0076) and Delhi (-0.0068). As

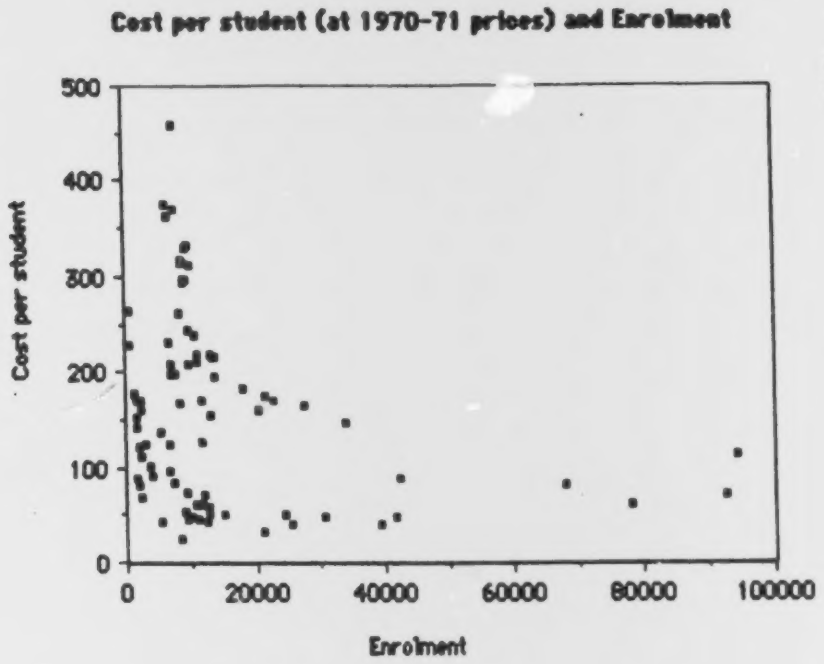
against them, those which showed low co-efficients were Allahabad (-0.0018), SNDT Bombay (-0.0013), Madras (-0.0012) and Annamalai (+0.0003). (Refer Table 1).

Table 1: b coefficients of different distance education institutions in India

1.	Directorate of Correspondence Courses Panjab University, Chandigarh	-0.046
2.	Directorate of Correspondence Courses Patna University, Patna	-0.0408
3.	Institute of Correspondence Courses Bombay University, Bombay	-0.0083
4.	Directorate of Distance Education Himachal Pradesh University, Shimla	-0.0076
5.	School of Correspondence Courses and Continuing Education, Delhi University	-0.0068
6.	Directorate of Correspondence Courses Allahabad University, Allahabad	-0.0018
7.	Department of Correspondence Courses and Distance Education, SNDT University, Bombay	-0.0013
8.	Institute of Correspondence Education Madras University, Madras	-0.0012
9.	Directorate of Distance Education Annamalai University, Annamalai	+0.0003
	Pooled Regression for all distance education institutions	-0.002

To assess the relationship between enrolment and cost per student, since observations of each directorate were relatively few, it was difficult to arrive at firm conclusions. It was, therefore, decided to pool all the observations of 9 distance education institutions. These 83 observations were plotted in a graph.

Graph I indicates a clear and negative relationship between enrolment and cost per student. it shows that as enrolment increases, cost per student has a tendency to decline.



GRAPH I

The pooled regression equation for 83 observations of all the distance education institutions, using dummy variable for each institutions separately, yielded the following result.

$Y = 255.148 - 0.002X$

Pooled regression analysis confirmed the negative relationship between enrolment and cost per student.

COURSE-WISE COST PER STUDENT IN ANNAMALAI UNIVERSITY DIRECTORATE OF DISTANCE EDUCATION

Break-up of coursewise costs for Annamalai University was available for 5 years only i.e. 1981-82 to 1985-86. The data given in the Budget Estimates for various years has been collected on the basis of actual expenditure incurred. For each course, the data was provided under separate heads, such as Academic Cost, Non-academic Cost, Printing Cost, Lesson writing Cost, Personal Contact Programme Cost, library Cost, Stationery and other miscellaneous costs. Academic costs for the Foundation Course, B.A. (History), B.A. (Sociology), B.A. (Psychology) were grouped under one head. It was decided to allocate these costs on a pro rata basis among these courses. Another problem was that academic costs for B.A.L. and Diploma in Law Course were not given separately. It was decided to allocate the costs to these courses on a pro rata basis of enrolment. With these adjustments, the costs of different courses were calculated. These costs for the different courses for different years are presented in table 6 for the purpose of comparison. (Refer tables 1 to 5).

A close perusal of table 6 reveals that the extent of variation in cost per student at the undergraduate level was relatively small, it was much larger in the case of post-graduate courses. However, courses like B.Ed., M.Ed., and Diploma in Management, in which enrolment was very large indicated economies of scale vis-a-vis other courses as their cost per student was relatively lower.

To understand the relationship between enrolment and cost per student, we have regrouped the data in two broad sub-groups -- (i) Undergraduate courses and (ii) post-graduate courses; and worked out

costs per student at current prices. By making use of the linking factor on the basis of consumer price index for non-manual employees, we derived costs per student at 1970-71 prices. The results are tabulated in table 7.

Table 7: **Enrolment and cost per student for undergraduate and post-graduate courses in Directorate of Distance Education, Annamalai University**

	1981-82	1982-83	1983-84	1984-85	1985-86
Enrolment					
1. Undergraduate	3,109 (14.8)	4,029 (15.9)	4,155 (16.9)	3,992 (13.1)	6,014 (15.3)
2. Post-graduate	17,943 (85.2)	21,368 (84.1)	20,410 (83.1)	26,428 (86.9)	33,297 (84.7)
3. Total	21,052 (100.0)	25,397 (100.0)	24,565 (100.0)	30,420 (100.0)	39,311 (100.0)
TOTAL COST (RS. AT CURRENT PRICES)					
4. Undergraduate	2,10,854 (13.0)	3,82,445 (14.6)	5,19,423 (14.6)	6,96,392 (15.6)	6,97,719 (13.4)
5. Postgraduate	14,15,589 (87.0)	22,39,119 (85.4)	30,51,573 (85.4)	37,66,450 (84.4)	44,96,987 (86.6)
6. Grant total	16,26,443 (100.0)	26,21,564 (100.0)	35,70,996 (100.0)	44,62,847 (100.0)	51,94,706 (100.0)
COST PER STUDENT (RS. AT CURRENT PRICES)					
7. Undergraduate	67.8	94.9	125.0	174.4	116.0
8. Postgraduate	78.9	104.8	149.5	142.4	135.1
9. Total	77.3	103.2	145.4	146.6	132.1
COST PER STUDENT (RS. AT 1970-71 PRICES)					
10 Undergraduate	28.5	37.0	43.7	57.5	36.0
11 Postgraduate	33.1	40.9	52.3	47.0	41.9
12 Total	32.5	40.2	50.9	48.4	40.9

But for the year 1984-85, cost per student at constant prices are lower at the undergraduate level than at the post-graduate level. This indicates that starting more and more post-graduate and diploma courses is likely to lead to a rise in the cost per student. A deeper analysis of 1984-85 data reveals that two courses viz., B.Ed. course and Diploma in Management with an enrolment of 10,723 and 3,116 respectively showed much lower cost per student as against the overall average. Similarly M.A. Sociology with an enrolment of 2,012 students also indicates relatively much lower cost per student. Since these three courses (B.Ed., Diploma in Management and M.A. Sociology) accounted for 15,851 students i.e. 60 per cent of total enrolment in all post-graduate courses, the overall impact of their high weightage was to lower overall cost per student in post-graduate courses.

Coursewise enrolment and Cost Per Student

Another exercise was attempted to find whether there is any correlation between coursewise enrolment and cost per student (Measured at current prices). The relationship was tested for 1984-85 and 1985-86. In Directorate of Distance Education, Annamalai University there were 22 courses being run in 1984-85 and 24 courses in 1985-86. Data of enrolment showed that enrolment varied from less than 100 to over 11,000 in a course. The hypothesis tested was: Whether a larger enrolment in a course led to a decline in cost per student?

For 1984-85, the following results of the regression analysis were obtained.

$Y = 71.04985 - 0.00469\ X$

$R = -0.36695$

For 1985-86, the following results of the regression analysis were obtained.

$$Y = 204.77641 - 0.0140\ X$$

$$R = -0.2486$$

From the results of the both the sets of data (1984-85 and 1985-86) it became clear that there is a negative correlation between enrolment and cost per student, though the R values indicate that the relationship is weak and not very significant. The hypothesis that increase in enrolment results in a decline in costs was found to be valid on a coursewise basis.

TABLE 1: DIRECTORATE OF DISTANCE EDUCATION ANNAMALAI UNIVERSITY

COURSEWISE COST PER STUDENT FOR THE YEAR 1981-82

(RS. AT CURRENT PRICES)

COURSES OFFERED	NO.OF STUD.	ACADEMIC COST	NON-ACA. COST	TOTAL SALARY	PRINTG	LESSON WRIT.	P.C.P.	LIBR.	STATION ERY	OTHER MISC.	TOTAL COST	COST PER
FOUNDATION COURSE	1,510	8,420	30,903	39,323	17,322	13,662	3,391	464	8,766	25,757	108,685	71.98
B.A. HIST.	95	530	1,944	2,474	1,090	860	213	29	552	1,620	6,838	71.98
B.A.SOCIO	41	229	839	1,068	470	371	92	12	238	699	2,950	71.95
B.A.PSYCHO.	28	156	573	729	321	253	63	9	163	478	2,016	72.00
B.LIT.	136	758	2,783	3,541	1,560	1,230	305	42	790	2,320	9,788	71.96
B.COM.	710	3,959	14,531	18,490	8,145	6,424	1,595	218	4,122	12,111	51,105	71.98
B.A.L.	589	---	12,504	12,054	289	1,169	229	2,265	3419	10,047	29,472	50.04
M.A. TAMIL	605	14,779	12,382	27,181	22,861	17,750	---	---	3,512	10,320	81,624	134.92
M.A.ENG.	718	12,430	14,694	27,124	9,924	6,500	1,644	3,055	4,168	12,247	64,662	90.06
M.A.HIST.	783	22,827	16,025	38,852	3,610	5,000	---	1,687	4,546	13,356	67,051	85.63
M.A.PSYCHO.	465	24,363	9,516	33,879	6,471	5,000	187	3,741	2,700	7,932	59,910	128.84
M.A.SOCIO.	1,670	14,799	34,178	48,977	7,014	10,000	1,970	668	9,695	28,486	106,810	63.96
M.SC.MATHS.	2,655	13,927	54,336	68,263	32,301	9,050	4,804	963	15,414	45,267	176,062	66.32
M.SC.PHYSI.	664	16,310	13,589	29,899	18,262	700	12,660	1,362	3,855	11,326	78,064	117.57
M.COM.	782	13,927	16,004	29,931	8,622	10,000	1,600	---	4,540	13,339	68,032	87.00
B.ED.	5,702	152,893	116,695	269,588	9,233	700	13,351	3,095	33,103	97,261	426,331	74.77
M.ED.	2,220	59,743	45,434	105,177	19,813	11,250	9,003	1,635	12,888	37,867	197,633	89.02
DIP.IN LAW	1,679	---	34,362	34,362	6,202	3,331	651	6,458	9,747	28,639	89,390	53.24
TOTAL	21052	3,60,070	4,30,842	7,90,912	1,73,510	103,250	51,758	25,703	122,218	359,092	1626,443	77.26

Note: Due to non-availability of data for under-graduate courses, Foundation Course cost is divided on pro rata basis for under-graduate courses.

Source: Budget Estimate (1983-84), Annamalai University

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TABLE 2: DIRECTORATE OF DISTANCE EDUCATION: ANNAMALAI UNIVERSITY

COURSEWISE COST PER STUDENT FOR THE YEAR 1982-83

(RS. AT CURRENT PRICES)

COURSES OFFERED	NO.OF STUD.	ACA COST	NON-ACA. COST	TOTAL SALARY	PRINTG COST	LESSON WRIT.	P.C.P.	LIBR.	STATION ERY	OTHER MISC.	TOTAL COST	COST PER STU
FOUNDATION COURSE	1,483	10,059	30,357	40,416	28,321	1,396	1,000	---	21,637	35,221	127,991	86.31
B.A. HIST.	376	2,550	7,697	10,247	7,181	354	254	---	5,486	8,930	32,452	86.31
B.A.SOCIO	179	1,214	3,664	4,878	3,418	168	121	---	2,612	4,251	15,448	86.30
B.A.PSYCHO.	106	719	2,170	2,889	2,024	100	71	---	1,547	2,517	9,148	86.30
B.LIT.	489	3,317	10,010	13,327	9,339	460	330	---	7,135	11,614	42,205	86.31
B.COM.	979	6,640	20,040	26,680	18,696	922	660	---	14,284	23,251	84,493	86.31
B.A.L.	417	14,531	8,536	230,67	29,343	2,236	74	---	6,084	9,904	70,708	169.56
M.A. TAMIL	473	25,584	9,682	35,266	43,296	16,250	---	---	6,901	11,234	112,947	238.79
M.A.ENG.	699	26,386	14,309	40,695	27,140	6600	838	797	10,198	16,601	102,869	147.17
M.A.HIST.	705	154	14,431	14,585	14,245	7,500	390	1,285	10,286	16,744	65,035	92.25
M.A.ECO	178	---	3,644	3,644	458	---	---	---	2,597	4,227	10,926	61.38
M.A.PSYCHO.	452	23,607	9,252	32,859	21,731	7,850	1,773	---	6,595	10,735	81,543	180.40
M.A.SOCIO.	1,947	23,519	39,855	363,374	25,333	8,250	2,601	710	28,407	46,241	174,916	89.84
M.SC.MATHS.	2,730	27,715	55,883	83,598	85,822	6,400	5,790	3,433	39,831	64,837	289,711	106.12
M.SC.PHYSI.	766	24,282	15,680	39,962	58,907	14,050	9,399	344	11,176	18,192	151,130	197.30
M.COM.	808	23,482	16,540	40,022	32,708	13,125	719	5,035	11,789	19,190	122,588	151.72
B.ED.	7,851	157,397	160,710	318,107	65,678	---	22,759	15,632	114,546	186,461	723,183	92.11
M.ED.	2,957	57,170	60,530	117,700	26,456	---	12,994	261	43,143	70,229	270,783	91.57
DIP.IN LAW	1,802	2,304	36,887	39,191	14,112	9,664	1,433	---	26,291	42,797	133,488	74.08
TOTAL	25,397	430,630	519,877	950,507	513,308	95,325	61,206	27,497	370,545	603,176	26,21,564	103.23

Note: Due to non-availability of data for under-graduate courses, foundation course cost is divided on pro-rata basis for under-graduate courses

Source: Budget Estimate (1984-85), Annamalai University

98

99

TABLE - 3 ANNAMALAI UNIVERSITY

COURSEWISE COST PER STUDENT FOR THE YEAR 1983-84

(RS. AT CURRENT PRICES)

COURSES OFFERED	NO.OF STUD.	ACADEMIC COST	NON-ACA COST	TOTAL SALARY	PRINTG	LESSON WRIT.	P.C.P	LIBR.	STATION ERY	OTHER MISC.	TOTAL COST	COST PER
FOUNDATION COURSE	1,345	11,409	43,945	55,354	31,777	1,215	1,195	---	35,152	50,885	175,577	113.64
B.A.PSYCHO	117	864	3,328	4,192	2,406	92	91	---	2,662	3,853	13,295	113.64
B.A. HIST.	272	2,009	7,737	9,746	5,594	214	210	---	6,189	8,958	30,910	113.64
B.A.SOCIO	150	1,108	4,266	5,374	3,085	118	116	---	3,413	4,940	17,045	113.64
B.LIT.	461	3,404	13,112	16,516	9,482	363	357	---	10,489	15,183	52,390	113.64
B.COM.	1,150	8,492	32,710	41,202	23,653	904	890	---	26,165	37,875	130,689	113.64
B.A.L.	460	6,479	13,084	19,563	39,677	10,081	50	4,531	10,466	15,150	99,517	216.34
M.A. TAMIL	413	98,273	11,747	110,020	52,775	---	40	1,130	9,397	13,602	186,964	452.70
M.A.ENG.	590	78808	16,782	95,590	37,717	---	48	12,527	13,424	19,432	178,738	302.95
M.A.HIST.	808	8,313	22,982	31,295	18,001	---	364	5,680	18,384	26,612	100,336	124.18
M.A.ECONO	324	11,964	9,216	21,180	25,245	16,708	60	879	7,372	10,671	82,115	253.44
M.A.PSYCHO	489	26,382	13,909	40,291	24,768	2,658	564	12,383	11,126	16,105	107,895	220.64
M.A.SOCIO.	1,662	26,424	47,273	73,697	25,014	---	2,803	2,043	37,814	54,738	196,109	118.00
M.SC.MATHS.	1,941	48,266	55,208	103,474	72,906	---	4,917	2,497	44,161	63,927	291,882	150.38
M.SC.PHYSI.	742	28,340	21,105	49,445	17,215	6,550	6,796	5,754	16,882	24,438	127,080	171.27
M.COM.	953	27,421	27,106	54,527	31,307	1,300	840	8,894	21,683	31,387	149,938	157.33
B.ED.	7,854	220,608	223,394	452,002	91,264	5,663	31,036	55,140	178,693	258,673	1072,471	136.55
M.ED.	2,347	48,281	66,756	115,037	46,190	---	18,910	2,360	53,399	77,299	313,195	133.44
DIP.IN LAW	2,287	32,212	65,050	97,262	18,831	881	519	---	52,034	75,323	244,850	107.06
TOTAL	24,565	697,056	698,710	1395,766	576,907	46,747	69,806	113,818	558,900	809,052	3570,996	145.37

Note: Due to non-availability of data for under-graduate courses, Foundation Course cost is divided on pro-rata basis for under graduate courses

Due to non-availability of teaching cost for Diploma in Law course, BAL course teaching cost is divided on pro rata basis. Other miscellaneous includes: (i) General Printing (Rs. 34,967), (ii) Postage and telegrams (Rs. 3,07,267), , (iii) Advertisement (Rs. 1,93,850), and (iv) Library and misc. Rs. 2,72,988).

Source: Budget Estimates (1985-86), Annamalai University

TABLE - 4

ANNAMALAI UNIVERSITY

COURSEWISE COST PER STUDENT FOR THE YEAR 1984-85

(RS. AT CURRENT PRICES)

COURSES OFFERED	NO.OF STUD.	ACADEMIC COST	NON-ACA COST	TOTAL SALARY	PRINTG	LESSON WRIT.	P.C.P.	LIBR.	STATION ERY	OTHER MISC.	TOTAL COST	COST PER/S
FOUNDATION COURSE	1,208	24,952	30,911	55,863	74,731		971	----	41,265	29,606	202,436	167.58
B.A. HIST.	463	16,351	11,848	28,199	21,363	36	----	2,902	15,816	11,347	79,663	172.06
B.A.SOCIO	308	16,522	7,881	24,403	11,729		----	701	10,521	7,549	54,903	178.26
B.A.PSYCHO	212	15,642	5,425	21,067	19,134	2,022	60	1,372	7,242	5,196	56,093	264.59
B.LIT.	670	---	17,144	17,144	47,352	435	72	----	22,887	16,420	104,310	155.69
B.COM.	844	13,085	21,597	34,682	46,957	1,250	417	2,613	28,831	20,685	135,435	160.47
B.A.L.	287	8,431	7,344	15,775	29,946		54	942	9,804	7,031	63,552	221.44
M.A. TAMIL	284	63,363	7,267	70,630	49,249		88	----	9,701	6,960	136,628	481.08
M.A.ENG.	562	101,651	14,381	116,032	15,206	388	432	15,782	19,198	13,774	180,812	321.73
M.A.HIST.	856	27,617	2,1904	49,521	16,716		297	3,304	29,241	20,979	120,058	140.25
M.A.ECONO	439	15,642	11,233	26,875	37,794	7,123	84	395	14,996	10,759	98,026	223.29
M.A.PSYCHO	566	31,931	14,483	46,414	16,966	450	30	5,069	19,334	13,872	102,135	180.45
M.A.SOCIO.	2,012	31,931	51,484	83,415	27,093		2,179	----	68,730	49,310	230,727	114.68
M.SC.MATHS.	1,958	62,671	50,103	112,774	73,167	2,030	3,470	1,315	66,885	47,987	307,628	157.11
M.SC.PHYSI.	700	59,712	17,912	77,624	49,881		13,064	2,353	23,912	17,156	183,990	262.84
M.SC.CHEM.	189	28,590	4,836	33,426	188	2,945	----	----	6,456	4,632	47,647	252.10
M.S.ZOOLOGY	256	17,052	6,551	23,603	288	4,876	---	----	8,745	6,274	43,786	159.32
M.COM.	721	31,931	18,449	50,380	28,654	1,452	634	5,293	24,629	17,670	128,712	178.52
B.ED.	10,723	297,180	274,388	571,568	110,812		42,483	8,945	366,296	262,801	1362,905	127.10
M.ED.	2,192	77,034	56,090	133,124	30,829	2,825	16,980	2,303	74,878	53,722	314,661	143.55
DIP.IN LAW	1,854	54,462	47,441	101,903	11,501		629	828	63,332	45,438	223,631	120.62
DIP.IN MST.	3,116	---	79,734	79,734	2,693	17,028	----	2,840	106,442	76,367	285,104	91.50
TOTAL	30,420	995,750	778,408	17,77,158	722,247	42,860	81,944	56,957	1039,141	745,535	4462,842	148.08

Note: Due to non-availability of teaching cost for Diploma in Law course, and BAL course teaching cost is divided on pro-rata basis

Other miscellaneous costs include (i) General Printing (Rs. 41,778), (ii), Postage and Telegram (Rs. 3,07,412) (iii) Advertisement (Rs. 1,54,736) and (iv) Library, furniture and equipment (Rs. 2,41,612).

Source: Budget Estimates (1986-87), Annamalai University

TABLE 5: ANNAMALAI UNIVERSITY

COURSEWISE COST PER STUDENT FOR THE YEAR 1985-86

(RS. AT CURRENT PRICES)

COURSES OFFERED	NO.OF STUD.	TEACHING COST	NON-TEA. COST	TOTAL SALARY	PRINTG	LESSON WRIT.	P.C.P.	LIBR.	STATION ERY	OTHER MISC.	TOTAL COST	COST PER/STU.
FOUNDATION COURSE	1,222	30,335	31,961	62,296	27,140	5	2,884	----	21,856	29,411	143,592	117.50
B.A. HIST.	544	35,661	14,228	49,889	1,351	306	119	----	9,730	13,093	74,488	136.93
B.A.SOCIO	407	19,468	10,645	30,113	4,233	----	44	----	7,279	9,796	51,465	126.45
B.A.PSYCHO	271	20,643	7,088	27,731	3,544	----	44	----	4,847	6,522	42,686	157.52
B.LIT.	942	37,390	24,638	62,028	19,664	----	160	----	16,848	22,672	121,372	128.84
B.COM.	1,864	24,255	48,753	73,008	14,102	893	408	246	33,339	44,862	166,858	89.52
B.A.ECONO	96	----	2,511	2,511	1,057	----	----	----	1,717	2,310	7,595	79.11
B.A.MATHS	159	----	4,159	4,159	1,816	----	----	----	2,844	3,827	12,646	79.53
B.A.L.	509	20,022	13,313	33,335	22,295	----	31	----	9,104	12,250	77,015	151.31
M.A. TAMIL	620	205,270	16,216	221,486	15,536	----	30	84	11,089	14,922	263,147	424.43
M.A.ENG.	921	210,389	24,089	234,478	28,515	----	929	2,639	16,473	22,166	305,200	331.38
M.A.HIST.	772	32,565	20,192	52,757	3,316	----	64	2,122	13,808	18,580	90,647	117.42
M.A.ECONO	471	14,679	12,319	26,998	8,302	415	120	1,281	8,424	11,336	56,876	120.76
M.A.PSYCHO	584	39,889	15,327	55,216	17,910	----	350	1,321	10,481	14,104	99,382	169.59
M.A.SOCIO.	1,914	38,562	50,060	88,622	13,065	----	1,598	645	34,233	46,066	184,229	96.25
M.SC.MATHS.	3,149	80,825	82,362	163,187	47,151	----	2,270	6,073	56,322	75,789	350,792	111.40
M.SC.PHYSI.	692	157,559	18,099	175,658	3,769	----	8,682	5,214	12,377	16,655	221,755	320.45
M.SC.CHEM.	380	132,807	9,939	142,746	45,698	10,646	3,460	11,892	6,797	9,146	230,385	606.28
M.S.ZOOLOGY	515	116,577	13,470	130,047	50,981	15,821	4,239	7,441	9,211	12,395	230,135	446.86
M.COM.	1,491	59,876	38,997	98,873	26,507	----	368	2,592	26,667	35,885	190,892	134.52
B.ED.	11,711	412,935	3,06,300	719,235	54,582	----	8,956	7,002	209,458	281,858	12,81,091	109.39
M.ED.	4,723	103,125	123,529	226,654	17,383	4,388	2,717	4,960	84,474	113,672	454,248	96.18
DIP.IN LAW	1,426	56,093	37,297	93,390	8,895	1,850	255	2,218	25,505	34,321	166,434	116.71
DIP.IN MST.	3,926	12,682	102,684	115,366	61,731	18,285	3,659	8,024	70,219	94,490	371,774	94.70
TOTAL	39,311	18,61,607	10,28,176	28,89,783	498,353	52,609	40,777	63,754	703,102	946,128	31,94,706	132.14

Note: Due to non-availability of teaching cost for Diploma in Law course, and B.A.L. course teaching cost is divided on pro-rata basis.

Other Miscellaneous costs include (i) General Printing (Rs. 39,368), (ii) Postage and Telegraph (Rs. 3,33,392), (iii) Advertisement (Rs. 2,28,822), and (iv) Library, Furniture and Equipment (Rs. 3,24,547)

Source: Budget Estimate (1987-88), Annamalai University

TABLE 6

ANNAMALAI UNIVERSITY

COURSEWISE COST PER STUDENT FOR DIFFERENT YEARS (1981-82 TO 1985-86)
(RS. AT CURRENT PRICES)

COURSES OFFERED	1981-82		1982-83		1983-84		1984-85		1985-86	
	NO.OF STUD.	COST PER STUD.	STUD.	COST	STUD.	COST	STUD.	COST	STUD.	COST
FOUND.COURSE	1510	66.55	1483	86.31	1514	113.64	1208	167.58	1222	117.50
B.A.HIST.	95	66.55	376	86.31	272	113.64	463	172.06	544	136.93
B.A.SOCIO	41	66.54	179	86.30	150	113.64	308	178.26	407	126.45
B.A.PSYCHO	28	66.57	106	86.30	117	113.64	212	264.59	271	157.52
B.LIT.	136	66.56	489	86.31	461	113.64	670	155.69	942	128.84
B.COM.	710	66.55	979	86.31	1150	113.64	844	160.47	1864	89.52
B.A. ECO	---	---	---	---	---	---	---	---	96	79.11
B.SC MATHS	---	---	---	---	---	---	---	---	159	79.53
B.A.L.	389	81.85	417	192.74	460	216.34	287	221.40	509	150.93
M.A. TAMIL	605	134.92	473	238.79	413	452.70	284	481.06	620	424.43
M.A. ENG	718	90.06	699	147.17	590	302.95	562	321.73	921	331.38
M.A. HIST.	783	85.63	705	92.25	808	124.18	856	140.25	772	117.42
M.A. ECO	---	---	178	61.38	324	253.44	439	223.29	471	120.76
M.A. PSYCHO	465	124.84	452	180.40	489	220.64	566	180.45	586	169.59
M.A. SOCIO	1670	63.96	1947	89.84	1662	118.00	2012	114.68	1914	96.25
M.SC. MATHS	2655	66.32	2730	106.12	1941	150.38	1958	157.11	3149	111.40
M.SC.PHY	664	117.57	766	197.30	742	171.27	700	262.84	692	320.45
M.SC. CHEM	---	---	---	---	---	---	189	252.10	380	606.28
M.S. ZOO.	---	---	---	---	---	---	256	159.32	515	446.86
M.COM.	782	87.00	808	151.72	953	157.33	721	178.52	1491	134.52
M.ED.	5702	74.77	7851	92.11	7854	136.55	10723	127.10	11711	109.39
M.ED.	2220	89.02	2957	91.57	2347	133.44	2192	143.55	4723	96.18
DIP.IN LAW	1679	50.23	1802	68.71	2287	107.06	1854	120.62	1426	116.71
DIP.IN MST	---	---	---	---	---	---	3116	91.50	3926	94.70
TOTAL	21052	77.26	25397	103.23	24565	145.37	30420	148.08	39311	132.14

SOURCE: BUDGET ESTIMATES (1983-84 TO 1987-88), ANNAMALAI UNIVERSITY

COURSEWISE COSTS OF THE SCHOOL OF CORRESPONDENCE COURSES AND CONTINUING EDUCATION, UNIVERSITY OF DELHI

Coursewise costs of the School of Correspondence Courses and Continuing Education have been attempted for three years, i.e. 1986-87, 1987-88 and 1988-89.

We have taken actuals cost incurred during the three years -- 1986-87 to 1988-89 for the following heads of account:

Teaching Cost, Non-teaching Cost, Library Cost., PCP Cost., Printing Cost, Lesson Writing Cost, Administrative Cost (Stationery cost and postage and Telegrams Cost).

Procedure for calculation of different costs:

Teaching Cost:

There are difficulties in allocating the teaching cost to different courses because teaching staff is involved in teaching a number of courses in their respective disciplines simultaneously. Their allocation was difficult. Consequently, we have allocated teaching cost on the basis of the number of student-papers in each course.

The student-papers for each course have been calculated by multiplying the number of students in each class with the number of papers a student is required to study. Then aggregating the total number of student-papers in different classes (Part I, Part II and Part III), of a course, we have obtained the total number of student papers in a course.

The student-papers in different courses have been given the following weights:

	Weights
B.A./B.Com. (Pass)	1.0
B.Com. (Hons)	1.5
B.A. (Hons) English	1.5
M.A./M.Com.	2.0

Basing our judgement on the effort required to prepare a course in terms of reading materials, it was felt that Honours course requires in terms of working hours 1.5 times effort in preparing a course and M.A./M.Com. Course requires 2.0 times effort in preparing a course. Even in terms of payment made for preparing course materials, the above mentioned weights were considered to be appropriate. On this basis, total teaching cost was allocated to each course in terms of weighted student papers - as a percentage in a particular course to the total (For weighted student-papers refer table 1).

Non-teaching Cost

We have taken non-teaching cost on pro rata basis. We have divided total non-teaching cost by total number of students in each course.

Library Cost

There are two types of costs under library head of account. One is related to the purchase of books and the other to the expenditure on furniture and equipments. In the first case, we have followed the same procedure as we have taken for calculating the teaching cost for

different courses. Here again we have taken the number of weighted student-papers into account for allocating the expenditure on books under library head of account. Expenditure on furniture and equipment are allocated on pro rata basis.

PCP Cost

PCP (Personal Contact Programme) cost also consists of two components:

(i) Honorarium paid to non-teaching staff working at the PCP Centres and also rent of buildings and repair of furniture; (ii) Actual figures of honorarium paid to teachers for each course were calculated from the record. At PCP Centres, where only one course was conducted, honorarium paid to non-teaching staff and rent and other expenditures was debited to the particular course. At PCP centres where more than one course was conducted, this part of the cost was allocated on a pro rata basis for the number of students in each course.

Printing Cost

Printing cost is divided into two components. First component includes identity cards, library slips, admission letters, notification folders, receipt books, radio talk schedule, examination forms, prospectus etc. These costs were allocated to different courses on pro rata basis since these costs are of a general nature. The second component pertains to reading materials, these costs have been worked out on a course-wise basis. Adding these two components gave us per student cost of printing.

Admission Cost includes: (i) non-teaching cost, (ii) Furniture and equipment cost, (iii) postage and telegram, stationery, (iv) Advertisement cost, (v) taxes on property (vi) other miscellaneous

expenditure. All these costs were allocated to different courses on pro rata basis.

Lesson Writing

Most of the work of lesson writing at the undergraduate level was done by the internal teaching staff. And in this case the procedure for allocating teaching cost has already been explained. But some reading material were prepared by outside teachers. Actual expenditure incurred for the purpose has been taken in the calculation. Since lessons are printed on a two-year basis, costs in a single year may not reflect a true picture, they may either exaggerate or may understate the position. To overcome this difficulty, it was decided that the average of three years (1986-87 to 1988-89) be taken.

Table 2, 3 and 4 provides us information about the absolute expenditure made on different heads after following the procedures detailed above for the three years 1986-87, 1987-88 and 1988-89.

From this, cost per student at current prices for each of the heads was calculated for the three years - 1986-87, 1987-88 and 1988-89 at current prices (Refer table 5, 6 and 7).

Table 8 provides us figures for cost per student at current prices for the 3-year period. Using the consumer price index for non-manual employees with 1987-88 as the base year, we derived cost per student at 1987-88 prices for the three years. (Refer table 9).

Since some costs may be incurred in a particular year, but their benefit accrues in the next year e.g. teaching materials are printed on a two-year basis. To overcome this difficulty, it was decided to take the weighted average cost for different courses for 3-year period by using the following formula:

Let C1, C2 and C3 be the costs per student during 1986-87, 1987-88 and 1988-89 respectively.

Let S1, S2 and S3 be the number of students enrolled during 1986-87, 1987-88 and 1988-89.

Then the weighted average cost (WAC) for the period 1986-87 to 1988-89 is given by the formula:

$$WAC = \frac{C1\ S1 + C2\ S2 + C3\ S3}{S1 + S2 + S3}$$

The results of the above exercise are tabulated in table 9.

Regression analysis between enrolment and cost per student

In Table 10, total enrolment for the 3-year period (1986-87 to 1988-89) has been taken as independent variable (X) and cost per student as dependent variable (Y).

The regression equation works to be:

$Y = 1511.5981 - 0.0235\ X$

$R = -0.60772$

Table 10: Enrolment and Cost per student for different courses in the School of Correspondence Courses, Delhi

Course offered	Total number of students during the period 1986-87 to 1988-89	Weighted average cost per student at 1987-88 prices for the period 1986-87 to 1988-89	Index of Unit cost with the overall average = 100
B.A. (P)	51,046	544.82	89.2
B.Com. (P)	24,607	550.84	90.1
B.Com. (H)	3,098	856.16	140.1
B.A. (Hons)	208	1,067.98	174.8
M.A. Hindi	1,642	1,277.00	209.0
M.A. Pol.Sc.	887	1,399.16	229.0
M.A. History	226	2,403.71	393.4
M.A. Sanskrit	337	2,310.76	378.2
M.Com.	2,023	1,222.33	200.0
Total	84,074	611.05	100.0

The analysis highlights the fact that courses with larger enrolment tend to have lower unit cost than courses with smaller enrolment. Since R = (-) 0.60772, obviously, the relation between cost and enrolment is negative and significant. It only implies that the School of Correspondence Courses and Continuing Education like a multiproduct firm has courses with very high enrolment and courses with low enrolment. The low enrolment courses tend to have high unit costs and high enrolment courses tend to have lower unit costs.

Although in the sphere of education, it would not be appropriate to run only such courses which have lower unit costs but it would be better to combine lower unit cost courses having larger enrolment with higher unit costs courses so that to the society, the average unit cost is much lower. In the School of Correspondence Courses, average unit costs for all courses is Rs. 611, although it is as low as Rs. 545 for B.A. (Pass) course and Rs.550 for B.Com. (Pass) course respectively and as high as Rs. 2,311 for M.A. Sanskrit and Rs. 2,404 for M.A. History. The range of variation from the overall average for all courses works out to be between 89 to 394 per cent.

TABLE 1: SCHOOL OF CORRESPONDENCE COURSES & CONTINUING EDUCATION, DELHI

COURSES	1988-89			1987-88			1986-87		
	ENROL.	NO. OF STUDENT PAPERS	NO. OF WEIGHTED STUDENT PAPERS	ENROL.	NO. OF STUDENT PAPERS	NO. OF WEIGHTED STUDENT PAPERS	ENROL.	NO. OF STUDENT PAPERS	NO. OF WEIGHTED STUDENT PAPERS
B.A. (PASS)	21,018	84,158	84,158	16,763	67,806	67,806	13,265	53,000	53,000
B.COM. (P)	9,486	37,944	37,944	7,937	31,748	31,748	7,184	28,736	28,736
B. COM. (H)	1,220	6,503	9,755	1,027	5,474	8,211	851	4,536	6,804
B.A.(H) ENG	208	832	1,398						
M.A. HINDI	628	5,008	10,016	549	4,392	8,784	467	3,736	7,472
M.A. HIST.	90	720	1,440	69	552	1,104	67	536	1,072
M.A.POL.SC.	360	2,880	5,760	300	2,400	4,800	227	1,816	3,632
M.A.SANSKT.	105	840	1,680	130	1,040	2,080	102	816	1,632
M.COM.	740	5,920	11,840	730	5,840	11,680	580	4,640	9,280
TOTAL	33,853	144,805	163,991	27,478	119,252	136,213	22,743	98,190	111,628

WEIGTHTS B.A./B.COM (PASS) = 1, B.A./B.COM (HONS) = 1.5 AND M.A./M.COM. = 2.0

TABLE 2: COURSEWISE TOTAL EXPENDITURE (1986-87) SCHOOL OF CORRESPONDENCE COURSES, DELHI
(IN RS. AT CURRENT PRICES)

COURSES	NO. OF STUDENTS	LESSON WRITING	PRINTING	PCP	TEACHING COST	LIBRARY COST	ADMINIS-TRATIVE COST	TOTAL COST
B.A. (P)	13,265	7,030	3,91,850	2,92,238	18,69,170	3,62,650	42,44,667	71,67,605
B.COM.(P)	7,184	2,505	1,84,413	1,82,647	10,06,305	1,95,189	22,98,808	38,69,867
B.COM.(H)	851	3,013	80,644	62,293	2,45,003	47,528	2,72,311	7,10,792
M.A. HINDI	467	5,376	55,824	60,883	2,61,669	50,763	1,49,435	5,83,950
M.A. HIST.	67	10,668	34,585	25,249	41,044	7,902	21,433	1,40,881
M.A.POL.SC	227	20,092	33,210	45,450	1,27,193	24,675	72,638	3,23,258
M.A.SANKT.	102	32,700	47,844	45,185	57,153	11,087	32,639	2,26,608
M.COM.	580	11,810	29,946	71,537	3,24,986	63,006	1,85,504	6,86,789
TOTAL	22,743	93,194	8,58,316	7,85,482	39,32,523	7,62,800	72,77,435	137,09,750

SCHOOL OF CORRESPONDENCE COURSES & CONTINUING EDUCATION
DELHI UNIVERSITY : DELHI - 110 007

TABLE 3: COURSEWISE TOTAL EXPENDITURE (1987-88)

(IN RS. AT CURRENT PRICES)

COURSES	NO. OF STUDENTS	LESSON WRITING	PRINTING	PCP	TEACHING COST	LIBRARY COST	ADMINIS-TRATIVE COST	TOTAL COST
B.A. (P)	16,763	3,520	4,27,792	95,046	30,77,184	4,09,688	55,38,169	95,51,399
B.COM.(P)	7,937	5,715	1,99,854	89,826	14,57,174	1,93,980	26,22,226	45,68,775
B.COM.(H)	1,027	822	99,239	18,600	4,01,290	53,414	3,39,300	9,12,665
M.A. HINDI	549	---	63,028	16,382	4,03,164	53,668	1,81,379	7,17,621
M.A. HIST.	69	9,299	62,940	22,346	50,668	6,708	22,796	1,74,757
M.A.POL.SC	300	6,453	44,841	8,822	2,20,293	29,319	99,134	4,08,862
M.A.SANKT.	130	14,919	36,369	41,499	95,486	12,671	42,949	2,43,893
M.COM.	703	2,137	29,590	13,034	5,16,332	68,739	2,32,257	8,62,089
TOTAL	27,478	42,865	9,63,653	3,05,555	62,21,591	8,28,187	90,78,210	174,40,061

SCHOOL OF CORRESPONDENCE COURSES AND CONTINUING EDUCATION
UNIVERSITY OF DELHI : DELHI - 110 007

TABLE 4: COURSEWISE TOTAL EXPENDITURE (1988-89)

(IN RS. AT CURRENT PRICES)

COURSES	NO. OF STUDENTS	LESSON WRITING	PRINTING	PCP	TEACHING COST	LIBRARY COST	ADMINIS-TRATIVE COST	TOTAL COST
B.A. (P)	21,018	16,758	5,16,053	3,97,212	31,16,330	3,75,930	64,60,092	108,82,375
B.COM.(P)	9,486	13,578	2,14,438	2,46,762	14,06,489	1,69,330	29,15,617	49,66,214
B.COM.(H)	1,220	6,824	1,00,641	78,751	3,96,183	47,963	3,74,979	10,05,341
B.A. (H) ENG	208	9,375	40,375	65,729	46,394	5,593	63,931	2,31,397
M.A. HINDI	626	16,375	75,821	73,187	3,71,149	44,646	1,92,407	7,73,585
M.A. HIST.	90	16,116	74,585	45,925	53,109	6,440	27,660	2,23,835
M.A.POL.SC	360	20,785	73,467	55,541	2,13,654	25,658	1,10,650	4,99,755
M.A.SANKT.	105	18,409	98,842	80,727	62,266	7,508	32,273	3,00,025
M.COM.	740	12,019	79,933	86,701	4,38,909	52,903	2,27,510	8,97,975
TOTAL	33,853	130,239	12,74,155	11,30,535	61,04,483	7,35,971	104,05,119	197,80,502

TABLE-5 SCHOOL OF CORRESPONDENCE COURSES & CONTINUING EDUCATION
UNIVERSITY OF DELHI : DELHI-110007

(RS. AT CURRENT PRICES)

COURSE-WISE COST PER STUDENT (1986-87)

COURSES	NO. OF STUDENTS	LESSON WRITING	PRINTING	P.C.P.	TEACHING COST	LIBRARY	ADMN. COST	TOTAL COST PER STUDENT
B.A. (P)	13,265	0.53	29.54	22.03	140.91	27.34	319.99	540.34
B.COM. (P)	7,184	0.35	25.67	25.42	140.08	27.17	319.99	538.68
B.COM. (H)	851	3.54	94.76	73.20	287.90	55.85	319.99	835.24
MA HINDI	467	11.51	119.53	130.37	560.32	108.70	319.99	1250.42
MA HISTORY	67	159.22	516.19	376.85	612.59	118.84	319.99	2103.68
MA POL.SC.	227	88.51	146.29	200.22	560.32	108.70	319.99	1424.03
MA SANSKRIT	102	320.47	469.04	442.97	560.32	108.70	319.99	2221.49
M.COM.	580	20.36	51.62	123.34	560.32	108.70	319.99	1184.33
TOTAL	22,743	4.10	37.74	34.54	172.91	33.54	319.99	602.82

Note: Administrative cost includes:
Non-teaching cost, Stationery, Advertisement, Postage & Telegrams and Library furniture and equipment cost.

SCHOOL OF CORRESPONDENCE COURSES AND CONTINUING EDUCATION
UNIVERSITY OF DELHI : DELHI - 110 007

TABLE 6: COURSEWISE COST PER STUDENT (1987-88)

(IN RS. AT CURRENT PRICES)

COURSES	NO. OF STUDENTS	LESSON WRITING	COST FOR PRINTING	PCP	TEACHING COST	LIBRARY COST	ADMINIS-TRATIVE COST	COST PER STUDENT
B.A. (P)	16,763	0.21	25.52	5.67	183.57	24.44	330.38	569.79
B.COM.(P)	7,937	0.72	25.18	11.33	183.58	24.44	330.38	575.63
B.COM.(H)	1,027	0.80	96.63	18.16	390.74	52.01	330.38	888.72
M.A. HINDI	549	---	114.79	29.84	734.36	97.75	330.38	1307.12
M.A. HIST.	69	134.77	912.18	323.85	734.32	97.22	330.38	2532.72
M.A.POL.SC	300	21.51	149.47	29.41	734.31	97.73	330.38	1362.81
M.A.SANKT.	130	114.68	278.99	319.22	734.01	97.47	330.38	1874.75
M.COM.	703	3.04	42.02	18.54	734.47	97.78	330.38	1226.23
TOTAL	27,478	1.56	35.07	11.12	226.42	30.14	330.38	634.69

SCHOOL OF CORRESPONDENCE COURSES AND CONTINUING EDUCATION
UNIVERSITY OF DELHI : DELHI - 110007

TABLE-7: COURSEWISE COST PER STUDENT (1988-89)

(IN RS. AT CURRENT PRICES)

COURSES	NO. OF STUDENT	LESSON WRITING	PRINTING	PCP	TEACHING COST	LIBRARY	ADMN. COST	COST PER STUDENT
B.A. (P)	21,018	0.80	24.55	18.90	148.27	17.86	307.36	517.76
B.COM.(P)	9,486	1.43	22.61	26.01	148.27	17.84	307.36	523.52
B.COM.(H)	1,220	5.59	82.49	64.55	324.74	39.15	307.36	823.88
B.A. (H) ENG.	208	45.07	194.11	316.00	223.05	26.89	307.36	1112.48
M.A. HINDI	626	26.16	121.12	116.91	592.89	71.48	307.36	1235.92
M.A. POL.SC.	360	57.74	204.07	154.28	593.49	71.55	307.36	1388.49
M.A. HISTORY	90	179.07	828.72	510.28	590.10	71.14	307.36	2486.67
M.A. SANSKRIT	105	175.32	941.35	768.83	593.01	71.50	307.36	2857.37
M.COM.	740	16.24	108.02	117.16	593.12	71.51	307.36	1213.41
TOTAL	33,853	3.85	37.64	33.40	180.32	21.74	307.36	584.31

TABLE-8: SCHOOL OF CORRESPONDENCE COURSES & CONTINUING EDUCATION
(IN RS. AT CURRENT PRICES)

COURSES	COST PER STUDENT		
	1986-87	1987-88	1988-89
B.A. (P)	540.34	569.79	517.76
B.COM.(P)	538.68	575.63	523.52
B.COM.(H)	835.24	888.72	823.88
B.A.(H) ENG	---	---	1112.48
M.A. HINDI	1250.42	1307.12	1235.92
M.A. HISTORY	2103.68	2532.72	2486.67
M.A. POL.SC.	1424.93	1362.81	1388.49
M.A. SANSKRIT	2221.49	1874.75	2857.37
M.COM	1184.33	1226.23	1213.41
ALL COURSES	602.82	634.69	584.31

SCHOOL OF CORRESPONDENCE COURSES AND CONTINUING EDUCATION
UNIVERSITY OF DELHI : DELHI - 110 007

TABLE - 9 : AVERAGE COST PER STUDENT

(IN RS. AT CONSTANT PRICES) 1987-88 AS BASE YEAR

COURSES OFFERED	NO. OF STUDENTS						WEIGHTED AVERAGE COST (1986-87 TO 1988-89)
	1986-87	1987-88	1988-89	1986-87	1987-88	1988-89	
	(S1)	(S2)	(S3)	(C1)	(C2)	(C3)	
B.A. (P)	13,265	16,763	21,018	558.97	569.79	497.05	544.82
B.COM.(P)	7,184	7,937	9,486	587.16	575.63	502.58	550.64
B.COM.(H)	851	1,027	1,220	910.41	888.72	790.92	856.16
B.A. (H) ENG	---	----	208	----	----	1067.98	1067.98
M.A. HINDI	467	549	626	1362.96	1307.12	1186.48	1277.00
M.A. POL.SC	227	300	360	1552.19	1362.81	1332.95	1399.16
M.A. HISTORY	67	69	90	2293.01	2532.72	2387.20	2403.71
M.A. SANSKRIT	102	130	105	2421.42	1874.75	2743.06	2310.76
M.COM.	580	703	740	1290.92	1226.23	1164.87	1222.33
TOTAL	22,743	27,478	33,853	657.07	634.69	560.94	611.05

Table 10: Staff Student Ratios in the School of Correspondence Courses, Delhi University, Delhi

	1985-86	1986-87	1987-88	1988-89
No. of students	21,466	22,743	27,478	33,853
No. of teachers	89	89	94	94
Students-teacher ratio	249.6:1	255.5:1	292.3:1	360.1:1
No. of non-teaching staff	216	228	243	243
Students-Non-teaching staff ratio	99.4:1	99.7:1	113.1:1	139.3:1

Note: This includes besides office staff, employees working in the library.

Table 11: Teaching staff in the School of Correspondence Courses & Continuing Education, University of Delhi

	1985-86	1986-87	1987-88	1988-89
Principal (Rs.4,500 - 7,300)	1	1	1	1
Lecturers in Reader's Grade (Rs. 3,700 - 5,700)	54	56	57	58
Lecturers in Senior Scale (Rs. 3,000 - 5,000)	2	8	12	13
Lecturer (Rs. 2,200 - 4,000)	29	24	24	22
Total	86	89	94	94

Table 12: Staff position in respect of School of Correspondence Courses and Continuing Education Delhi

S.No.	Name	No. of the posts			
		1985-86	1986-87	1987-88	1988-89
A.	**Office**				
1.	Deputy Registrar	1	1	1	1
2.	Accounts Officer	1	1	1	1
3.	Book Producer	1	1	1	1
4.	Assistant Rgistrar	1	2	2	3
5.	Section Officer	12	13	13	15
6.	Senior Assistant	13	19	19	19
7.	Assistant	40	37	37	37
8.	Jr. Assistant-cum-typist	36	31	31	28
9.	Sorter	12	12	12	12
10.	Daftri	12	12	12	12
11.	Peon	21	21	21	21
12.	Lesson Keeper	2	2	2	2
13.	Senior Proof Reader	2	2	2	2
14.	Junior Proof Reader	3	2	2	2
15.	Record Keeper	1	1	1	1
16.	Gestetner Operator	3	3	3	3
17.	Junior Bradma Operator	2	2	2	2
18.	Senior Bradma Operator	2	2	2	2
19.	Statistical Assistant	1	1	1	1
20.	Senior Personal Assistant	1	1	1	1
21.	Personal Assistant	2	2	2	2
22.	Stenographer (Jr.)	1	1	1	1
23.	Mali	2	2	2	2
24.	Safai Karamchari	5	5	5	5
25.	Havalder & Chowkidar	9	9	9	9
26.	Unskilled Labourer	2	2	2	2
27.	Farash	3	3	3	3
28.	Care-taker	1	1	1	1
29.	Electrician	-	1	1	1
30.	Bilingual Stenographer	-	1	1	1
31.	Receptionist-cum-Operator	-	1	1	1
32.	Projectionist	-	1	1	1
33.	Driver-cum-Mechanic	-	1	1	1
34.	Production Superintendent	-	1	1	1

COMPUTER CELL

35.	Programmer (Jr)	-	1	1	1
36.	Console Operator	-	2	2	2
37.	Word Processing Applicator	-	2	2	2
38.	Key Punch Operator	-	2	2	2
	Sub-total (a)	192	204	204	204
B.	**LIBRARY**				
39.	Professional (P.J.)	1	1	1	1
40.	Professional Assistant	5	5	5+2	5+2
41.	Sr. Professional Assistant	5	5	5+2	5+2
42.	Jr. Assistant-cum-typist	2	2	2+2	2+2
43.	Jr. Library Assistant	1	1	1	1
44.	Sr. Library Attendant	4	4	4+4	4+4
45.	Jr. Library Attendant	4	4	4+4	4+4
46.	Peon	-	-	1	1
47.	Cleaner	1	1	1	1
48.	Farash	1	1	1	1
	Sub-Total (b)	24	24	39	39
Grant total (A+B)		216	228	243	243

COMPARISON OF COST PER STUDENT IN SCHOOL OF CORRESPONDENCE EDUCATION (DELHI) WITH 12 COLLEGES OF DELHI UNIVERSITY

The University of Delhi had a total number of 53 colleges during 1985-86 to 1986-87, out of which 10 colleges are evening colleges. In order to draw a representative sample, we have included 12 colleges for determining cost per student as also fee income per student. The sample of 12 colleges includes 3 evening colleges. While making the choice of sample of 12 colleges, the enrolment ranges kept in view are:

Table 1: **Enrolment range and number of colleges in Delhi University**

Enrolment	No. of Colleges included in the sample	Total no. of Colleges in Delhi University
Less than 1,000	2	12
Between 1001 and 1,500	3	12
Between 1,501 and 2,000	5	21
More than 2,000	2	8
Total	12	53

From a perusal of the data given above, it is evident that the sample can be considered as fairly representative of the total number of colleges in Delhi University.

Cost per student for 12 colleges and the School of Correspondence Courses of Delhi University was calculated for 1985-86, 1986-87 and 1987-88. Also fee income realised per student was also calculated at current prices. The next step was to convert cost per student at current prices into cost per student at constant prices (1987-88 prices being used as the base). To remove any abnormality in a particular year, average of the costs per students for the three years (1985-86, 1986-87 and 1987-88) was derived. The average of enrolment for the three years for each college was also calculated.

The data given in table 7 reveal that average cost per student varied between Rs. 2,569 -- lowest for Satyawati College (Evening) and Rs. 5,814 -- the highest for St. Stephen's college. Several factors may be responsible for this wide variation in costs in these colleges. The probable explanation may lie in (a) type of courses being run in different colleges. For instance, teacher-pupil ratio prescribed for Honours Courses by Delhi University is 1:12 and that for Pass Courses is 1:20. A larger proportion of Honours Course students in a college raises the teacher costs significantly. The existence of science courses (B.Sc. General) and B.Sc. (Hons) in which the teacher pupil ratio is 1:15 and 1:12 respectively further raises costs in colleges where enrolment in Science Courses forms a significant proportion of total enrolment. This entails substantial expenditure on laboratories and conduct of practicals. As against it, the existence of a larger proportion of B.A. (Pass) and B.Com. (Pass) course students results in costs remaining low. A second factor responsible for divergence in costs

may be the age of the college. Older colleges have a larger proportion of teaching faculty in the Reader's grade as against relatively younger colleges.

An average taken of all the 12 colleges in the sample revealed that cost per student in regular colleges was Rs. 4,217 as against Rs. 651 in the School of Correspondence Courses. In other words, it was possible to provide instruction to 6.5 students in the School of Correspondence Courses as against 1 student in a regular college with the same cost.

Table 7: Average enrolment and cost per student for Delhi Colleges

	Colleges	Average Enrolment for 1985-86 to 1987-88	At 1987-88 prices: Average cost per student for 1985-86 to 1986-87 (Rs)
		(X)	(Y)
1.	St. Stephen's College	987	5,814
2.	Miranda House	2,105	5,364
3.	K. M. College	2,087	4,710
4.	I. P. College	1,833	4,952
5.	Zakir Hussain College	2,030	4,601
6.	SGTB Khalsa College	2,239	4,213
7.	Vivekananda Mahila College	1,147	4,211
8.	Swami Shradhnanda College	2,023	3,489
9.	Satyawati College (M)	1,636	3,750
10.	Zakir Hussain College (E)	1,326	3,466
11.	SGTB Khalsa College (E)	1,325	2,746
12.	Satyawati College (E)	1,057	2,569

Source: Data abstracted from table 6 for Enrolment and cost per student for average of 3-year period (1985-86 to 1987-88) at 1987-88 prices.

Correlation coefficient between enrolment and cost per student has been calculated. The analysis shows that co-efficient of Correlation (R) is + 0.277 which indicates that correlation is positive but insignificant. Obviously, with growth of enrolment, there would be certain other factors such as diversification of courses, introduction of honours and science courses which may be working in favour of an increase in cost.

We have also fitted regression equation between enrolment and cost per student for 12 colleges included in our study. The equation works out as under:

$$Y = 3165.3 + 0.601\ X$$

Here X represents the independent variable enrolment and Y stands for cost per student.

The positive value of b = + 0.601 only indicates that if enrolment increases by 100, cost per student increases by Rs. 60. This is due to fact that when a college expands its enrolment, it would not multiplicate sections in a course which it is running already. But more importantly, an institutions intends to diversify its courses, start new honours or science courses or certain vocational courses which raise the prestige of the institution, but are at the same time more costly.

TABLE 2

ANALYSIS OF COST OF EDUCATION OF A SAMPLE OF DELHI COLLEGES (1985-86)

(RS. AT CURRENT PRICES)

NAME OF COLLEGES	SALARY (ACA & NON ACADEMIC)	OTHER CHARGES	TOTAL EXPENSES	FEE INCOME	NO.OF STUD.	COST PER/S	FEE INCOME PER/S	SUBSIDY PER STUDENT
ST.STEPHEN COLLE.	34,82,057	9,90,921	44,72,978	3,52,586	868	5,153	406	4,747
	(78.0)	(22.0)	(100)	(8.0)			(8.0)	(92.0)
MIRANDA HOUSE	65,09,852	22,05,709	87,15,561	3,88,490	2,018	4,319	193	4,126
	(75.0)	(25.0)	(100.0)	(4.0)			(4.0)	(96.0)
K.M. COLLEGE	69,74,123	8,60,381	78,34,504	5,47,704	1,990	3,937	275	3,662
	(89.0)	(11.0)	(100.0)	(7.0)			(7.0)	(93.0)
I.P. COLLEGE	58,11,612	7,35,132	65,46,744	4,08,689	1,726	3,793	237	3,556
	(89.0)	(11.0)	(100.0)	(6.0)			(6.0)	(94.0)
Z.H.COLLEGE (M)	58,11,569	11,36,253	69,47,822	4,55,661	1,974	3,520	231	3,289
	(84.0)	(16.0)	(100.0)	(7.0)			7	(93.0)
SGTB KHALSA (M)	66,65,446	6,10,569	72,76,015	4,78,023	2,077	3,503	230	3,273
	(92.0)	(8.0)	(100.0)	(7.0)			(7.0)	(93.0)
V.MAHILA COLLEGE	32,79,365	3,27,153	36,06,518	2,74,930	1,132	3,186	243	2,943
	(91.0)	(9.0)	(100.0)	(8.0)			(8.0)	(92.0)
SWAMI S. COLLEGE	46,49,693	4,49,700	50,99,393	3,47,273	1,949	2,616	178	2,438
	(91.0)	(9.0)	(100.0)	(7.0)			(7.0)	(93.0)
SATYAWATI (M)	30,89,549	11,52,079	42,41,628	3,42,401	1,561	2,717	219	2,498
	(73.0)	(27.0)	(100.0)	(8.0)			(8.0)	(92.0)
Z.H.COLLEGE (E)	30,04,638	3,12,067	33,16,705	2,18,506	1,278	2,595	171	2,424
	(91.0)	(9.0)	(100.0)	(7.0)			(7.0)	(93.0)
SGTB KHALSA (E)	23,69,936	2,72,766	26,42,702	2,46,054	1,289	2,050	120	1,930
	(90.0)	(10.0)	(100.0)	(6.0)			(6.0)	(94.0)
SATYAWATI (E)	17,58,905	2,82,686	20,41,591	2,30,016	993	2,056	232	1,824
	(86.0)	(14.0)	(100.0)	(11.0)			(11.0)	(89.0)
TOTAL	5,34,06,745	93,35,416	6,27,42,161	42,90,333	18,855	3,328	228	3,100
	(85.0)	(15.0)	(100.0)	(7.0)			(7.0)	(93.0)
SCHOOL OF CORRES-PONDENCE COURSES	76,93,420	43,86,191	1,20,79,611	60,98,018	21,466	563	284	279
	(63.7)	(36.3)	(100.0)	(50.4)			(50.4)	(49.6)

TABLE 3

ANALYSIS OF COST OF EDUCATION OF A SAMPLE OF DELHI COLLEGES (1986-87)
(RS. AT CURRENT PRICES)

NAME OF COLLEGES	SALARY TEACHING & NON-TEACH.	OTHER CHARGES	TOTAL EXPEN.	FEE INCOME	NO. OF STUDENTS	COST PER STUDENT	FEE INCOME PER/STU	SUBSIDY PER STUDENT
ST. STEPHEN	40,85,089 (86.7)	6,27,240 (13.3)	47,12,329 (100.0)	363,382 (7.7)	898	5,245 (100.0)	405 (7.7)	4,840 (92.3)
MIRANDA HOUSE	70,42,149 (74.5)	24,08,204 (25.5)	94,50,353 (100.0)	4,20,067 (4.4)	2112	4,475 (100.0)	199 (4.4)	4,276 (95.6)
KIRORI MAL	76,68,156 (90.6)	7,94,178 (9.4)	84,62,334 (100.0)	5,66,158 (6.7)	2050	4,128 (100.0)	276 (6.7)	3,852 (93.3)
I.P. COLLEGE	66,51,933 (93.2)	4,74,769 (6.8)	70,26,702 (100.0)	4,15,938 (5.9)	1730	4,062 (100.0)	240 (5.9)	3,822 (94.1)
ZAKIR HUSSAIN	65,31,338 (88.6)	8,38,688 (11.4)	73,70,026 (100.0)	5,18,119 (7.0)	2086	3,533 (100.0)	248 (7.0)	3,285 (93.0)
SGTB KHALSA (M)	68,23,868 (89.9)	7,66,814 (10.1)	75,90,682 (100.0)	5,33,063 (7.0)	2480	3,061 (100.0)	215 (7.0)	2,846 (93.0)
VIVEKA. MAHILA	35,83,907 (92.9)	2,74,350 (7.1)	38,58,257 (100.0)	2,82,617 (7.3)	1166	3,309 (100.0)	242 (7.3)	3,067 (92.7)
SWA.SHRADHNAND	53,37,414 (91.1)	5,21,442 (8.9)	58,58,856 (100.0)	3,57,078 (6.1)	1953	3,000 (100.0)	183 (6.1)	2,817 (93.9)
SATYAWATI CO-ED	39,91,373 (81.5)	9,04,535 (18.5)	48,95,908 (100.0)	3,80,181 (7.8)	1646	2,974 (100.0)	231 (7.8)	2,743 (92.2)
ZAKIR HUSS.(E)	33,24,093 (91.9)	2,94,706 (8.1)	36,18,799 (100.0)	2,36,123 (6.5)	1336	2,705 (100.0)	176 (6.5)	2,529 (93.5)
SGTB KHALSA (E)	27,88,612 (95.0)	1,47,773 (5.0)	29,36,385 (100.0)	2,59,818 (8.9)	1377	2,132 (100.0)	189 (8.9)	1,943 (91.1)
SATYAWATI (E)	19,14,927 (90.2)	2,08,990 (9.8)	21,23,917 (100.0)	2,45,399 (11.5)	1000	2124 (100.0)	245 (11.5)	1,879 (88.5)
TOTAL (ALL COLLEGES	5,96,42,859 (87.8)	82,61,689 (12.2)	6,79,04,548 (100.0)	45,77,943 (6.8)	19,836	3,423 (100.0)	231 (6.8)	3,192 (93.2)
SCHOOL OF C.C.	87,47,575 (63.8)	49,62,175 (36.2)	1,37,09,750 (100.0)	68,56,421 (100.0)	22,743	603 (100.0)	301 (49.9)	302 (50.1)

TABLE 4

COST OF EDUCATION OF DELHI COLLEGES (1987-88)

NAME OF COLLEGES	SALARY ACA- NON-ACA	OTHER CHARGES	TOTAL EXPENSES	FEE INCOME	NO. OF STUDENTS	COST PER STUDENT	FEE INCOME P'STU	SUBSIDY PER STUDENT
ST.STEP.COLLEGE	53,03,923	14,42,193	67,46,116	4,36,883	1,195	5,645	366	5,279
	(78.62)	(21.38)	(100.0)	(6.5)		(100.0)	(6.5)	(93.5)
MIRANDA HOUSE	96,38,653	37,38,478	1,33,77,131	5,76,073	2,186	6,119	264	5,855
	(72.1)	(27.9)	(100.0)	(4.3)		(100.0)	(4.3)	(95.7)
KIRORI MAL	93,44,612	17,30,279	1,10,74,891	6,19,090	2,221	4,986	279	4,707
	(84.4)	(15.6)	(100.0)	(5.6)		(100.0)	(5.6)	(94.4)
I.P. COLLEGE	98,36,065	24,88,905	1,23,24,970	6,01,807	2,071	5,951	291	5,660
	(79.8)	(20.2)	(100.0)	(4.9)		(100.0)	(4.9)	(95.1)
ZAKIR HUSSAIN	94,32,227	23,45,767	1,17,77,994	5,08,383	2,031	5,799	250	5,549
	(80.1)	(19.9)	(100.0)	(4.3)		(100.0)	(4.3)	(95.7)
SGTB KHALSA (M)	88,39,522	23,17,873	1,11,57,395	4,58,041	2,159	5,168	212	4,956
	(79.2)	(20.8)	(100.0)	(4.1)		(100.0)	(4.1)	(95.9)
VIVE.MAHILA	56,27,726	3,97,375	60,25,101	2,73,112	1,144	5,267	239	5,028
	(93.4)	(6.6)	(100.0)	(4.5)		(100.0)	(4.5)	(95.5)
SWAMI SHRADH.	80,57,030	8,49,237	89,06,267	4,81,879	2,167	4,110	222	3,888
	(90.5)	(9.5)	(100.0)	(5.4)		(100.0)	(5.4)	(94.6)
SATYA.COLLEGE	60,54,456	21,10,516	81,64,972	3,94,855	1,700	4,803	232	4,571
	(74.2)	(25.8)	(100.0)	(4.8)		(100.0)	(4.8)	(95.2)
ZAKIR HUSS. (E)	53,92,160	58,83,290	59,80,489	2,74,215	1,363	4,388	201	4,187
	(90.2)	(9.8)	(100.0)	(4.6)		(100.0)	(4.6)	(96.0)
SGTB KHALSA (E)	41,71,927	4,00,766	45,72,693	2,60,703	1,308	3,496	199	3,297
	(91.2)	(8.8)	(100.0)	(5.7)		(100.0)	(5.7)	94.3
SATYA. COLL.(E)	30,18,392	4,73,932	34,92,324	2,98,348	1,178	2,965	253	2,712
	(86.5)	(13.5)	(100.0)	(8.5)		(100.0)	(8.5)	(91.5)
TOTAL	8,47,16,693	1,88,83,650	10,36,00,343	51,83,389	20,723	4,994	250	4,744
	(82.0)	(18.0)	(100.0)	(5.0)		(100.0)	(5.0)	(95.0)
SCHOOL OF CORRESPONDENCE COURSES	1,20,75,653	53,64,408	1,74,40,061	84,32,042	27,478	635	307	328
	(69.2)	(30.8)	(100.0)	(48.3)		(100.0)	(48.3)	(51.7)

NOTE: FIGURES IN PARENTHESIS ARE PERCENTAGE TO TOTAL.

TABLE 5

COST PER STUDENT FOR DELHI COLLEGES

(IN RS. AT CURRENT PRICES)

	NAME OF COLLEGES	1985-86	1986-87	1987-88
1	ST.STEPHEN COLLEGE	5,153	5,245	5.645
2	MIRANDA HOUSE	4.319	4,475	5.119
3	K.M. COLLEGE	3,937	4.128	4.986
4	I.P. COLLEGE	3.793	4.062	5.951
5	ZAKIR HUSSAIN COLLEGE (M)	3,520	3,533	5.799
6	SGTB KHALSA COLLEGE (M)	3.503	3,061	5.168
7	VIVEKANANDA MAHILA COLLEGE	3.186	3,309	5,267
8	SWAMI SHRADHNAND COLLEGE	2,616	3,000	4,110
9	SATYAWATI CO.ED. COLLEGE (M)	2.717	2,974	4.803
10	ZAKIR HUSSAIN COLLEGE (E)	2,595	2,705	4,388
11	SGTB KHALSA COLLEGE (E)	2,050	2,132	3,496
12	SATYAWATI CO.ED. COLLEGE (E)	2.056	2,124	2,965
	TOTAL	3.328	3,423	4,994
	SCHOOL OF CORRES PONDENCE COURSES	563	603	635

TABLE 6

COST PER STUDENT FOR DELHI COLLEGES

(IN RS. AT CONSTANT PRICES
BASE YEAR = 1987-88)

NAME OF COLLEGES	1985-86	1986-87	1987-88	AVERAGE FOR 1985-86 TO 1987-88	NO. OF STUDENTS 1985-86	1986-87	1987-88	AVERAGE FOR 1985-86 TO 1987-88
1. ST.STEPHEN COLLEGE	6,081	5,717	5,645	5,814	868	896	1,195	987
2. MIRANDA HOUS	5,096	4,878	6,119	5,364	2,018	2,112	2,186	2,105
3. K.M. COLLEGE	4,646	4,499	4,986	4,710	1,990	2,050	2,221	2,087
4. I.P. COLLEGE	4,476	4,428	5,951	4,952	1,726	1,730	2,071	1,833
5. ZAKIR HUSAIN COLLEGE	4,154	3,851	5,799	4,601	1,974	2,086	2,031	2,030
6. SGTB KHALSA (M)	4,134	3,337	5,168	4,213	2,077	2,480	2,159	2,239
7. VIVEKANANDA MAHILA COLLE	3,759	3,607	5,267	4,211	1,132	1,156	1,144	1,147
8. SHAMI SHRADHA. COLLEGE	3,087	3,270	4,110	3,489	1,949	1,953	2,167	2,023
9. SATYAWATI CO.ED COLLEGE (M)	3,206	3,242	4,803	3,750	1,561	1,646	1,700	1,636
10 ZAKIR HUSSAIN COLLEGE (E)	3,062	2,948	4,388	3,466	1,278	1,338	1,363	1,326
11 SGTB KHALSA	2,419	2,324	3,496	2,746	1,289	1,377	1,308	1,325
12 SATYAWATI CO.ED. COLLEGE (E)	2,426	2,315	2,965	2,569	993	1,000	1,178	1,057
TOTAL (1 - 12)	3,927	3,731	4,994	4,217	18,855	19,836	20,723	19,805
SCHOOL OF CORR. COURSES	662	657	635	651	21,466	22,743	24,478	22,896

ANALYSIS OF FACTORS DETERMINING COST PER STUDENT IN DELHI UNIVERSITY COLLEGES

For making an analysis of the factors determining cost per student in the Colleges of Delhi University, data for 30 colleges for the year 1987-88 was collected.

Cost of education per student was considered to be dependent on 5 variables: (i) Total enrolment (ii) proportion of honours students in total enrolment, (iii) age of the college, (iv) type of management -- public or private trust and (v) nature of the college - Day or Evening college.

The hypotheses sought to be tested were:

(i) Does an increase in enrolment lead to a decline in cost?

(ii) Does a high proportion of honours students in total enrolment lead to a rise in unit cost?

(iii) Is the age of college associated with an increase in unit cost?

(iv) Does the type of management -- public or private trust affect unit cost significantly?

(v) Does the nature of college - Day or Evening College - affect unit costs significantly?

A priori reasoning leads one to believe that an increase of enrolment by distributing fixed costs over a large number of students should lead to a decline in unit cost. On the other hand, it is argued that since increase of enrolment is associated with diversification of courses, introduction of new courses and not merely by a repititive increase of the existing courses, there should be no decrease in unit costs. Moreover, if the new courses are more prestigious, like Honours Courses in Arts or Science Courses in Chemistry, Physics, Botany, Zoology, Psychology, Computer Science or Electronics, this phenomenon

should lead to an increase in unit costs. It has been generally observed that at the initial stage, a college starts with B.A. (Pass), B.Com. (Pass) or B.Sc. (General Course) and as these courses get established, colleges apply for the introduction of more prestigious science courses or honours courses. The hypothesis, therefore, that need to be tested was: Does an increase in enrolment lead to a decline in costs?

(ii) In Delhi University, Honours Courses are more demanding in terms of teaching hours, quality of teaching staff required and the creation of laboratory facilities in case of science courses, especially so in courses like electronics and computer science. Moreover, teacher-pupil ratio in case of Honours courses approved by the UGC is 1:12 as against 1:20 for Pass Course. Thus, as the proportion of Honours course students in total enrolment increases, it should lead to a rise in Unit cost. The hypothesis to be tested is: Does a high proportion of honours students in total enrolment lead to a rise in unit cost?

(iii) In a recently established college, the average pay of the teacher as well as that of the non-academic staff is relatively less, since most of the members of the staff are young and just at the initial stages of the pay scales. But as years roll on and a college matures, more and more teachers become eligible for senior scale; moreover, with yearly increments and other perks added on, the average pay of the teaching and non-teaching staff increases. In addition to this, more and more persons become eligible for one-time upward movement after 8 years of service in a scale. Besides this, more facilities are also demanded by the staff. Moreover, with advancement of age, there is diversification of courses and introduction of more prestigious courses. All these factors result in increase in unit

costs. But as the age of the college reaches nearly 30 years, senior persons begin to retire and they are replaced by junior persons. This should lead to a decline in unit costs. To assess the net effect of cost-pushing and cost-reducing factors, the hypothesis to be tested is: Is the age of a college associated with an increase in unit costs?

(iv) Delhi University has three types of colleges based on the type of management -- (a) University maintained colleges in whose case cent per cent deficit (i.e. expenditure minus fee income) is financed by the University Grants Commission; (b) Colleges under Delhi Administration in whose case 95 per cent of the deficit is financed by the UGC and the remaining 5 per cent is financed by Delhi Administration. Since in both cases, deficit is financed either by the Central Government via UGC or the State Government, these colleges have been grouped under "public" and the remaining colleges which are maintained by private trusts have been described as "private colleges"; (c) Private colleges are also financed to the extent of 95 per cent of their deficit by the UGC and 5 per cent of the deficit is met by the private trust. But it is generally believed that even to economize on contributing 5 per cent of total deficit, private trusts are far less liberal in their approach to permitting recruitment of staff and incurring such other expenditures as would lead to improvement in the quality of instruction. Some others believe that on account of clearly stated norms for the number of teachers to be appointed, non-academic staff that is permitted and other expenditures on library and laboratory, very little elbow room is available for the private trusts to cut corners. Consequently, it would not be proper to state that private trusts are able to depress costs. Thus, we have used 'private' trusts as a dummy variable to assess their influence on costs.

(v) Another belief in the minds of the people is that evening colleges have lower unit costs than Day colleges. This belief is born out of the fact that evening colleges work only for 3 to 4 hours. In this situation, they are not able to diversify their courses as well as the activities associated with the conduct of these courses. Moreover, it is also believed that students studying in evening colleges only intend to take B.A./B.Com. degree. Therefore, B.A. (Hons) or B.Com. (Hons) or B.Sc. (Hons) courses are not introduced in them. But more recently, in many evening colleges B.A. (Hons) and B.Com. (Hons) courses have been started. Thus the hypothesis sought to be tested was: Does the nature of the college -- Day or Evening College affect unit cost significantly?

To test this hypothesis, the technique of regression analysis was used:

Exercise 1: Regression output when C i.e. cost per student is dependent variable and regressed with D (total enrolment), E (Proportion of Honours students to total enrolment (%), F (age of college), G (Dummy variable private trust 1) and H (Dummy variable evening colleges 1).

Regression Output:
Constant 2307.8
Standard Error of Y Est = 762.9
R-Squared 0.676
No. of observations = 30
Degrees of Freedon = 24

	D	E	F	G	H
X coefficients	1.056	32.084	-11.551	-344.834	-208.176
Standard Error of Coefficients	0.413	12.524	11.650	471.125	493.744

From the value of the standard error and X coefficients, it is clear that since in the case of D and E, X coefficient is more than

2.5 times the standard error, the only variables of significance are D (Enrolment) and E (Proportion of Honours students in total enrolment).

Exercise 2:

Regression output by dropping Dummy Variable H and conducting regression analysis (C Dependent and D, E, F, and G as Independent)

Regression output:

Constant = 2095.865
Standard Error of Y estimate = 750.251
R-Squared = 0.674
No. of observations = 30
Degrees of freedom = 25

	D	E	F	G
X Coefficients	1.138	33.845	-12.225	-372.563
Standard error of Coefficients	0.358	11.611	11.547	488.776

From exercise 2, it is obvious that there is practically no change in the value of R^2 which implies that dummy variable H (Nature of the college - Day/Evening Colleges) did not have any significant effect in determining cost per student.

Exercise 3:

Regression output by dropping G (Private Colleges) and conducting regression analysis (C dependent and D, E, F and H as independent).

Regression output:

Constant = 2439.505
Standard error of Y estimate = 755.785
R squared = 0.669
No. of observations = 30
Degrees of freedom = 25

	D	E	F	H
X coefficient(s)	1.057	26.278	-11.913	-258.624
standard error	0.409	9.601	11.729	484.349

From exercise 3, it is obvious that there is again practically no change in the value of R^2 which implies that dummy variable K

(Private College) did not have any significant effect in determining cost per student.

The values of D and E again confirm that they are significant since the value of X coefficient is more than 2.5 times the value of standard error of the co-efficient. Age of the college again shows that it has no significant effect on unit cost.

Exercise 4:

Regression output by dropping G (Private College) along with H and conducting regression analysis (C dependent variable and D, E and F as Independents).

Regression Output:

Constant = 2184.342
Standard error = 745.322
R squared = 0.665
No. of observations = 30
Degrees of freedom = 26

	D	E	F
X co-efficients	1.161	27.918	-12.803
Standard error of coefficients	0.355	8.971	11.449

From exercise 4, it is obvious that there is practically no change in the value of $\bar{R}^2$ which implies that both dummy variables G and H when dropped did not have any significant effect in determining cost per student (C).

The values of D and E again confirm that they are significant since the value of X coefficients in both cases is more than 2.5 times the value of the standard error. It also underlines the fact that both enrolment (D) and proporton of Honours students in total enrolment (E) are positively correlated to unit cost.

Exercise 5:

Regression output by dropping F, G and H and conducting regression analysis (C dependent variable and D and E as independent variables).

Regression Output:

Constant = 2030.023
Standard error Y estimate = 748.772
R squared = 0.649
No. of observations = 30
Degrees of freedom = 27

	D	E
X coefficient(s)	1.181	22.234
Standard error of coefficient	0.356	7.426

From exercise 5, it is obvious that even dropping age of the college (F) along with variables G and H, there was a very marginal decline in R^2 which implies that the age of the College (F) did not have any significant effect in determining unit cost (C), though its effect is of a negative nature.

The values of D and E again confirm that they are significant since the value of X coefficients in both cases is more than 2.5 times the value of the standard error.

Exercise 6:

Regression output C as dependent and D as independent variable, dropping all other variables (E, F, G and H).

Regression output:

Constant = 1906.749
Standard error of Y estimate = 848.606
R squared = 0.533
No. of observations = 30
Degrees of freedom = 28

	D
X coefficient	1.821
Standard error of Coefficient	0.322

From exercise 6, the conclusion emerges that cost per student is dependent on enrolment (D) and this correlation is quite significant since R^2 = 0.533 and R = 0.73. It is also observed that the value of X-coefficient is more than 2.5 times the value of standard error. This further confirms that the relationship between C and D is significant. it also underlines the fact that enrolment is positively correlated with cost.

To summarize the results of our study:

(i) The hypothesis that increase in enrolment leads to a decline in costs is rejected. In fact, increase in enrolment in case of Delhi Colleges is positively and significantly correlated with costs.

(ii) The hypothesis that a high proportion of honours students in total enrolment leads to a rise in unit costs, is proved valid. High percentage of honours students is positively and significantly correlated with unit costs.

(iii) The age of the college is negatively related to unit costs, though not significantly.

(iv) Nature of management - private or public - is not significantly correlated with unit costs.

(v) The nature of the college - Day or Evening College - is not significantly correlated with unit costs.

The analysis of unit costs of Delhi Colleges reveals that two factors are significant in increasing unit costs - the increase in enrolment and high proportion of honours students in total enrolment. The latter further pushes cost upwards and thus reinforces the positive effect of the former.

TABLE:1 BASIC DATA FOR SELECTED COLLEGES UNDER DELHI UNIVERSITY (1987-88.

	SR. NO.	NAME OF THE COLLEGES	COST PER STUDENT	TOTAL ENROL.	PROPORTION HONOURS & ENROLMENT	AGE OF COLLEGE	DUMMY VARIABLE PRIVATE	DUMMY VARIBLE EVENING
CODE	A	B	C	D	E	F	G	H
D.A.M.	1	BHARATI MAHILA	4319	816	30.30	17	0.00	0.00
D.A.M.	2	GARGI COLLEGE	5998	1727	32.70	21	0.00	0.00
D.A.M.	3	KALINDI COLLEGE	5388	1453	42.20	21	0.00	0.00
D.A.M.	4	KAMLA NEHRU COLLEGE	5341	1736	49.40	24	0.00	0.00
D.A.M.	5	LAKSHMI BAI COLLEGE	4837	2146	38.10	23	0.00	0.00
D.A.M.	6	MAITREYI COLLEGE	5085	1853	26.90	21	0.00	0.00
D.A.M.	7	MOTILAL NEHRU	4882	1843	36.90	24	0.00	0.00
D.A.M.	8	SATYAWATI COLLEGE	4515	1700	24.40	16	0.00	0.00
D.A.M.	9	SHYAMA PRASAD	5317	1612	36.40	19	0.00	0.00
D.A.M.	10	SRI AUROBINDO	3624	1104	7.80	16	0.00	0.00
D.A.M.	11	SWAMI SHRADHNAND	4680	1842	13.00	21	0.00	0.00
U.M.	12	DYAL SINGH COLLEGE	5537	2031	43.10	29	0.00	0.00
U.M.	13	MIRANDA HOUSE	5681	2093	63.30	40	0.00	0.00
U.M.	14	RAMLAL ANAND	2222	831	12.00	24	0.00	0.00
P.M.	15	ARSD COLLEGE	5920	1798	51.90	29	1.00	0.00
P.M.	16	DAULAT RAM COLLEGE	6757	1904	62.20	28	1.00	0.00
P.M.	17	HANS RAJ COLLEGE	5875	2307	68.10	40	1.00	0.00
P.M.	18	HINDU COLLEGE	4875	1970	62.40	89	1.00	0.00
P.M.	19	JESUS & MARY COLLEGE	4019	1775	66.00	20	1.00	0.00
P.M.	20	LADY SRI RAM	6517	1564	76.00	32	1.00	0.00
P.M.	21	MATA SUNDRY COLLEGE	4461	2177	48.50	21	1.00	0.00
P.M.	22	S.R. COLLEGE OF COM.	5237	1285	91.90	62	1.00	0.00
P.M.	23	SGTB KHALSA COLLEGE	6067	2099	56.80	37	1.00	0.00
P.M.	24	SRI VENKATESWARA	5627	1592	61.20	27	1.00	0.00
EVE.	25	PGDAV (E)	2981	1028	21.50	30	0.00	1.00
EVE.	26	RAMLAL ANAND (E)	3120	699	0.90	15	0.00	1.00
EVE.	27	SHYAMLAL (E)	2138	730	15.90	19	0.00	1.00
EVE.	28	SRI AUROBINDO (E)	2740	652	0.00	4	0.00	1.00
EVE.	29	SGTB KHALSA (E)	3686	1285	17.70	15	0.00	1.00
EVE.	30	ZAKIR HUSSAIN (E)	5011	1174	22.10	30	0.00	1.00

D.A.M. : Delhi Administration Maintained,
U.M. : University Maintained
P.M. : Privately Managed
EVE. : Evening College

EXERCISE :1 C DEPENDENT AND D,E,F,G & H AS INDEPENDENT

Regression Output:

Constant			2507.840		
Std Err of Y Est			762.902		
R Squared			0.676		
No. of Observations			30.000		
Degrees of Freedom			24.000		
X Coefficient(s)	1.056	32.084	-11.551	-244.634	-208.176
Std Err of Coef.	0.413	12.524	11.850	471.125	493.744

EXERCISE #2 C DEPENDENT AND D,E,F & G AS INDEPENDENT

Regression Output:

Constant		2095.865			
Std Err of Y Est		750.251			
R Squared		0.674			
No. of Observations		30.000			
Degrees of Freedom		25.000			
X Coefficient(s)	1.138	33.845	-12.225	-372.563	-208.176
Std Err of Coef.	0.358	11.611	11.547	458.776	493.744

EXERCISE #3 C DEPENDENT AND D,E,F & H AS INDEPENDENT

Regression Output:

Constant		2439.505		
Std Err of Y Est		755.765		
R Squared		0.669		
No. of Observations		30.000		
Degrees of Freedom		25.000		
X Coefficient(s)	1.057	26.278	-11.913	-258.624
Std Err of Coef.	0.409	9.601	11.729	484.349

EXERCISE #4 C DEPENDENT AND D,E & F AS INDEPENDENT

Regression Output:

Constant		2184.342	
Std Err of Y Est		745.322	
R Squared		0.665	
No. of Observations		30.000	
Degrees of Freedom		26.000	
X Coefficient(s)	1.161	27.918	-12.803
Std Err of Coef.	0.355	8.971	11.449

EXERCISE #5 C DEPENDENT AND D & E AS INDEPENDENT

Regression Output:

Constant		2030.023	
Std Err of Y Est		748.772	
R Squared		0.649	
No. of Observations		30.000	
Degrees of Freedom		27.000	
X Coefficient(s)	1.181	22.234	-12.803
Std Err of Coef.	0.356	7.426	11.449

EXERCISE #6 C DEPENDENT AND D AS INDEPENDENT

Regression Output:

Constant		1906.749
Std Err of Y Est		848.696
R Squared		0.533
No. of Observations		30.000
Degrees of Freedom		28.000
X Coefficient(s)	1.821	
Std Err of Coef.	0.322	

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TABLE:2 DISTRIBUTION OF STUDENTS ENROLLED IN DIFFERENT COURSES IN SELECTED COLLEGES UNDER DELHI UNIVERSITY (1987-88).

SR. NO.	NAME OF THE COLLEGES	BA (P)	B.COM (P)	B.SC. GEN-A	B.SC. GEN-B	SUB TOTAL	B.A. (H)	B.COM. (H)	B.SC. (H)	SUB TOTAL	TOTAL (UG)	TOTAL (PG)	GRAND TOTAL
	DELHI ADMN. MAINTAINED COLLEGES												
1	BHARATI MAHILA	403	167	---	---	570	248	---	---	248	818	---	818
2	GARGI COLLEGE	397	484	166	115	1162	375	---	190	565	1727	---	1727
3	KALINDI COLLEGE	513	220	---	104	837	613	---	---	613	1450	3	1453
4	KAMLA NEHRU COLLEGE	347	391	---	---	738	816	42	---	858	1596	140	1736
5	LAKSHMI BAI COLLEGE	999	327	---	---	1326	726	91	---	817	2143	3	2146
6	MAITREYI COLLEGE	739	227	233	131	1330	499	---	---	499	1829	24	1853
7	MOTILAL NEHRU	543	385	167	---	1095	289	265	126	680	1775	68	1843
8	SATYAWATI COLLEGE	976	310	---	---	1286	225	189	---	414	1700	---	1700
9	SHYAMA PRASAD	833	170	---	---	1003	477	110	---	587	1590	22	1612
10	SRI AUROBINDO	458	538	---	---	996	108	---	---	108	1104	---	1104
11	SWAMI SHRADHNAND	548	762	147	146	1603	78	161	---	239	1842	---	1842
	UNIVERSITY MAINTAINED COLLEGES												
12	DYAL SINGH COLLEGE	395	360	301	88	1144	406	289	181	876	2020	11	2031
13	MIRANDA HOUSE	400	---	58	40	498	924	---	401	1325	1823	270	2093
14	RAMLAL ANAND	275	213	---	---	488	241	93	---	334	822	9	831
	PRIVATE MAINTAINED COLLEGES												
15	ARSD COLLEGE	179	285	309	---	773	418	256	260	934	1707	91	1798
16	DAULAT RAM COLLEGE	320	172	---	96	588	842	188	154	1184	1772	132	1904
17	HANS RAJ COLLEGE	99	38	123	87	347	604	353	613	1570	1917	390	2307
18	HINDU COLLEGE	128	---	125	---	253	707	120	403	1230	1483	487	1970
19	JESUS & MARY COLLEGE	451	152	---	---	603	817	355	---	1172	1775	---	1775
20	LADY SRI RAM					249	1079	109	---	1188	1437	127	1564
21	MATA SUNDRY COLLEGE	739	368	---	---	1107	926	130	---	1056	2163	14	2177
22	S.R. COLLEGE OF COM.	---	---	---	---	---	219	962	---	1181	1181	104	1285
23	SGTB KHALSA COLLEGE	246	177	211	102	736	559	196	438	1193	1929	170	2099
24	SRI VENKATESWARA	195	158	106	117	576	470	141	364	975	1551	41	1592
	EVENING COLLEGES												
25	PGDAV (E)	462	345	---	---	807	85	136	---	221	1028	---	1028
26	RAMLAL ANAND (E)	326	367	---	---	693	6	---	---	6	699	---	699
27	SHYAMLAL (E)	265	349	---	---	614	---	116	---	116	730	---	730
28	SRI AUROBINDO (E)	290	362	---	---	652	---	---	---	---	652	---	652
29	SGTB KHALSA (E)	467	590	---	---	1057	45	183	---	228	1285	---	1285
30	ZAKIR HUSSAIN (E)	587	328	---	---	915	163	96	---	259	1174	---	1174

STUDY OF COST OF DISTANCE EDUCATION INSTITUTIONS WITH DIFFERENT SIZE CLASSES IN INDIA

ABSTRACT AND CONCLUSIONS

The study of cost of distance education institutes with different size classes covered nine institutions. They are:

Table 1: Institutes of Distance Education included in the Study

		Enrolment in 1988-89
1.	School of Correspondence Courses and Continuing Education, Delhi	33,853
2.	Institute of Correspondence Courses, Bombay	15,148*
3.	Department of Correspondence Courses and Distance Education, SNDT Women's University, Bombay.	11,752
4.	Directorate of Distance Education, Himachal Pradesh, Shimla	13,090
5.	Institute of Correspondence Education Madras.	94,425
6.	Directorate of Correspondence Courses Panjab University, Chandigarh	7,719
7.	Directorate of Correspondence Courses Allahabad	2,940
8.	Directorate of Correspondence Courses Patna	4,167
9.	Directorate of Distance Education, Annamalai	41,554**
	Total	2,12,896

* for 1987-88 ** 1986-87

Total enrolment in these 9 institutions in 1988-89 was 2,12,896. The total enrolment of all distance education institutions during 1988-89 (including the Open Universities) was 4,52,243 in 1988-89.

Thus, the sample included in the study covers 47% of total enrolment in Distance Education institutions in India.

The sample has been drawn from the following enrolment ranges:

Table 2: Size class of Institutes included in the Study

Enrolment		Location of the Institute
Less than 5,000	2	(Allahabad and Patna)
5,001 to 10,000	1	(Panjab)
10,001 to 20,000	3	(Bombay, SNDT Bombay and Himachal Pradesh)
20,001 to 50,000	2	(Delhi and Annamalai)
50,001 and above	1	(Madras)

The study is restricted to recurring costs in Distance Education, since information on fixed costs was not available separately.

The study examines the shares of different components of costs and the sources of funding.

The study after calculating cost per student at current prices has converted units costs at 1970-71 prices by using consumer price index of non-manual employees since an analysis of the input factors suggests that a major component of the costs is similar to that of non-manual employees.

The study examines the relationship between enrolment and cost per student.

SOURCES OF FUNDING DISTANCE EDUCATION

On the basis of the study, Distance Education institutes can be grouped under two broad categories -- (i) surplus generating institutions, and (ii) deficit institutions. Our analysis reveals that Madras, Annamalai, SNDT Women's University, Patna and Allahabad are surplus generating institutions. The savings out of the fee income

of the students are used either to create infrastructures for distance education students and/or to augment the resources of the Universities. In some cases, the surpluses are generated by keeping a skeleton staff (both academic and non-academic). Some directorates like ICE, Madras with an enrolment of over 94,000 students had only 28 members of the teaching faculty. Similarly, very little is spent on student support services like organisation of personal contact programmes, library-cum-study centres, preparation of audio and video casettes etc. Likewise, expenditure incurred on the preparation of reading materials, printing of lessons etc. is very low. Thus, these DE institutions deliberately depress costs to generate surpluses. Table 3 gives an idea of the sources of funding distance education.

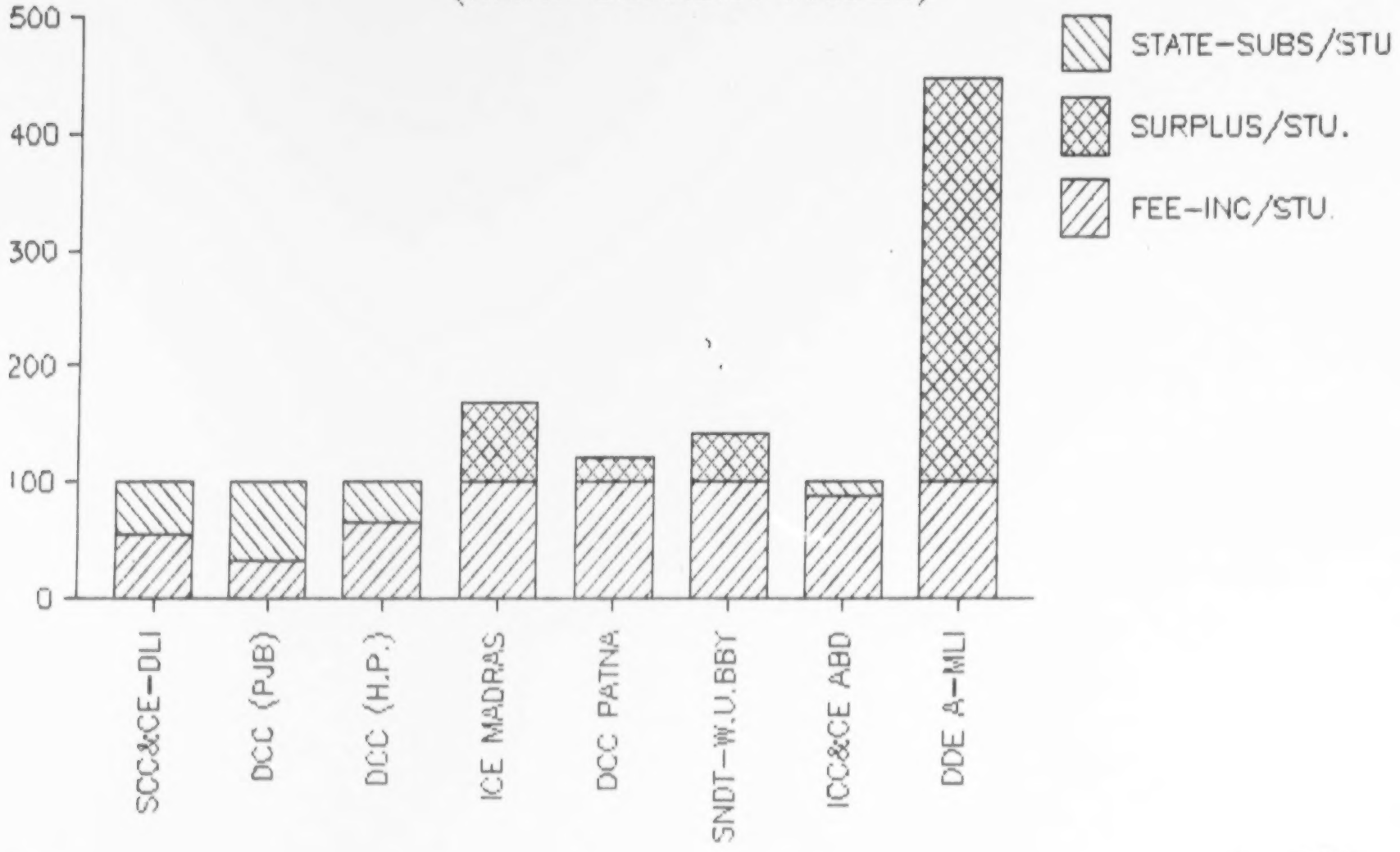
Table 3: Sources of Funding Distance Education

(Rs. at current prices)

Institute	Year	Cost per student	Fee Income per/stu.	Surplus per student	State subsidy per student
SCC&CE Delhi	1988-89	584 (100.0)	320 (54.8)	----	264 (45.2)
DCC, Punjab	1988-89	1,832 (100.0)	601 (32.8)	----	1,231 (67.2)
DCC, (H.P.)	1988-89	620 (100.0)	404 (65.2)	----	216 (34.8)
ICE, Madras	1988-89	473 (100.0)	794 (167.9)	321 (67.9)	----
DCC, Patna	1988-89	368 (100.0)	447 (121.4)	79 (21.4)	
SNDT Women's Univ.Bombay	1988-89	242 (100.0)	341 (140.8)	99 (40.8)	
ICC&CE Allahabad	1988-89	495 (100.0)	435 (88.0)		60 (12.e)
DDE, Annamalai	1985-86	132 (100.0)	590 (447.0)	458 (347.0)	

SOURCES OF FUNDING DISTANCE EDUCATION

(Rs.AT CURRENT PRICES)



As against it, there is the other category of DE institutions which run in a deficit and the deficit is either met by the Centre (UGC) and/or the State Government. SCC&CE, Delhi, DCC Panjab, and DCC (H.P.) fall in this category. This is largely due to higher teacher-pupil ratios and higher non-academic staff ratios in these institutions. In case of Delhi, fee income per student was as low as Rs. 320 and in DCC (H.P.) it was Rs. 404. Though fee income in DCC, Panjab was Rs. 601 per student, but with a low level of enrolment and a larger proportion of post-graduate students in total enrolment, cost per student jumped to Rs. 1,832. Student-teacher ratio in 1988-89 DCC, Panjab was 63:1 as against 3,366:1 in case of ICE, Madras. Similarly, non-teaching staff student ratio was 1:297 in case of ICE, Madras and 1:35 in case of DCC, Panjab. Between these two extremes falls SCC&CE, Delhi in which the student-teacher ratio in 1988-89 was 360:1, and the non-teaching staff-student ratio was 139:1 (Refer table 4).

Table 4: Staff student Ratios in selected Distance Education Institutions

		No. of students	Non-teaching staff	Students-non-teaching staff ratio	Teaching staff	Student teacher ratio
ICE Madras	1988-89	94,425	317	297:1	28	3366:1
DCC Panjab	1988-89	7,719	210	35:1	122	63:1
SCC Delhi	1988-89	33,853	243	139:1	94	360:1

Components of Costs in Various DE Institutions

Table 5 gives the components of costs in various Distance Education institutions. A broad break-up of costs into academic costs, non-academic salary cost and other costs reveals that academic cost varies from 1.7% of total cost in case of ICE, Madras, 4.6% in case of

SNDT (Women) Bombay to 38.5% in case of DCC, Panjab. Similarly, non-academic cost varies from 14.7% in case of ICE, Madras to 18.6% in case of DDE, Annamalai to 37.8% in case of DCC, Panjab. Thus, the salary component of cost varied widely from about 16% in case of ICE, Madras to 33 per cent in case of SNDT Bombay, to about 50% in case of DDE, Annamalai to 64% in case of SCC&CE, Delhi and peaking up to 76% in case of DCC, Panjab.

Table 5: Percentage Distribution of Components of Costs in various Distance Education Institutions

		Aca. cost	Non-Aca. cost	Total salary	Other costs	Total
ICE Madras	1988-89	1.7	14.0	15.7	84.3	100.0
SCC&CE Delhi	1988-89	30.9	33.3	64.2	35.8	100.0
DCC, Panjab	1988-89	38.5	37.8	76.3	23.7	100.0
DDE Bombay	1987-88	21.5	35.2	56.7	43.3	100.0
SNDT Bombay	1988-89	4.6	28.5	33.1	66.9	100.0
DCC H.P.	1988-89	30.9	34.2	65.1	34.9	100.0
DDE Annamalai	1986-87	31.3	18.6	49.9	50.1	100.0

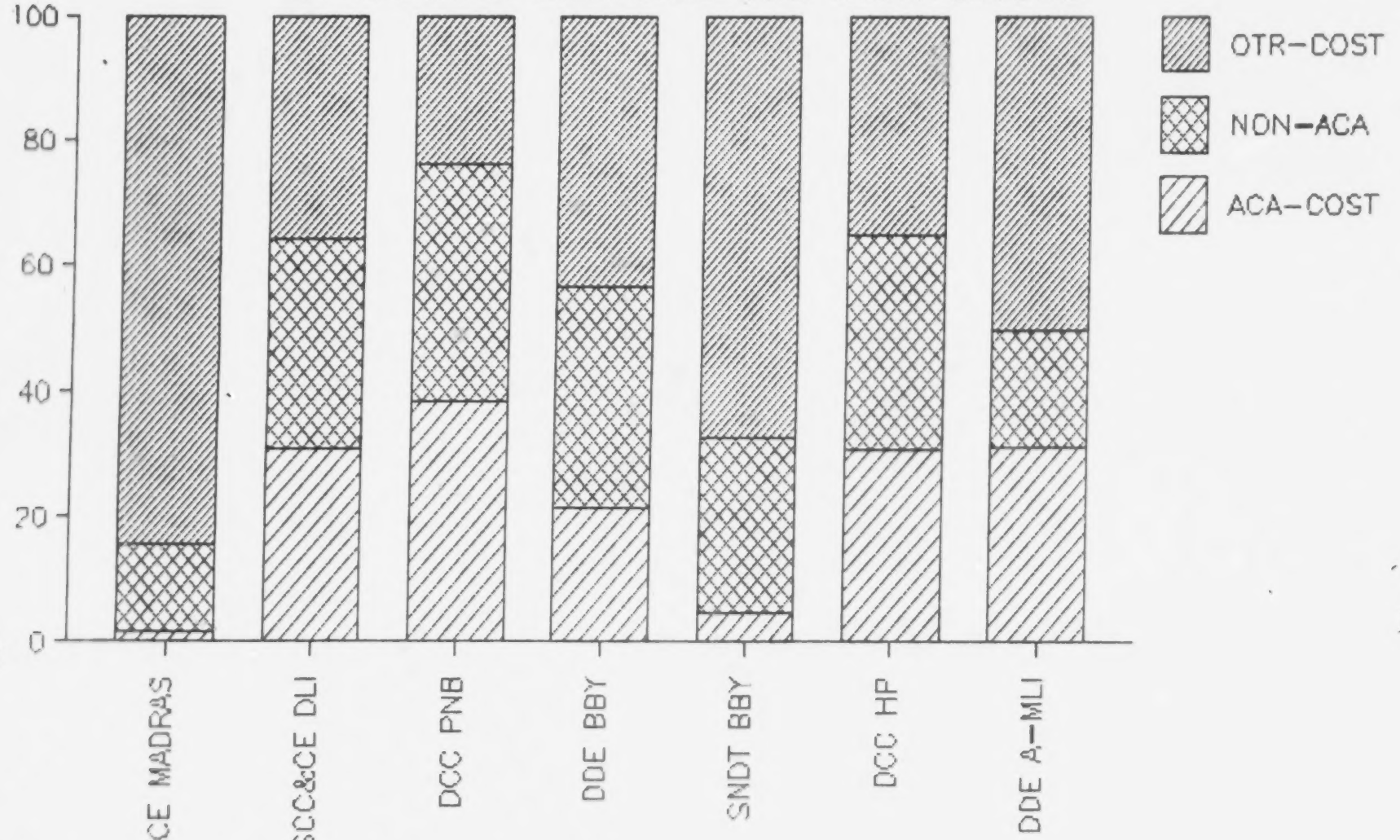
Thus, the non-salary component in different institutions varies widely from about 24% in case of DCC, Panjab to about 84% in case of ICE, Madras.

The upshot of the analysis is: absence of uniform or nearly uniform norms in terms of staff requirements create different environments in which DE institutions in India operate.

The above analysis of percentage distribution of costs should not mislead us to the conclusion that institutions in which salary

% DISTRIBUTION OF COMPONENTS OF COSTS

IN VARIOUS DISTANCE EDU INSTITUTIONS



component is low spend far greater amount on student support services. For this purpose, we have to take into account per student expenditure on different heads, rather than percentage distribution as our basis.

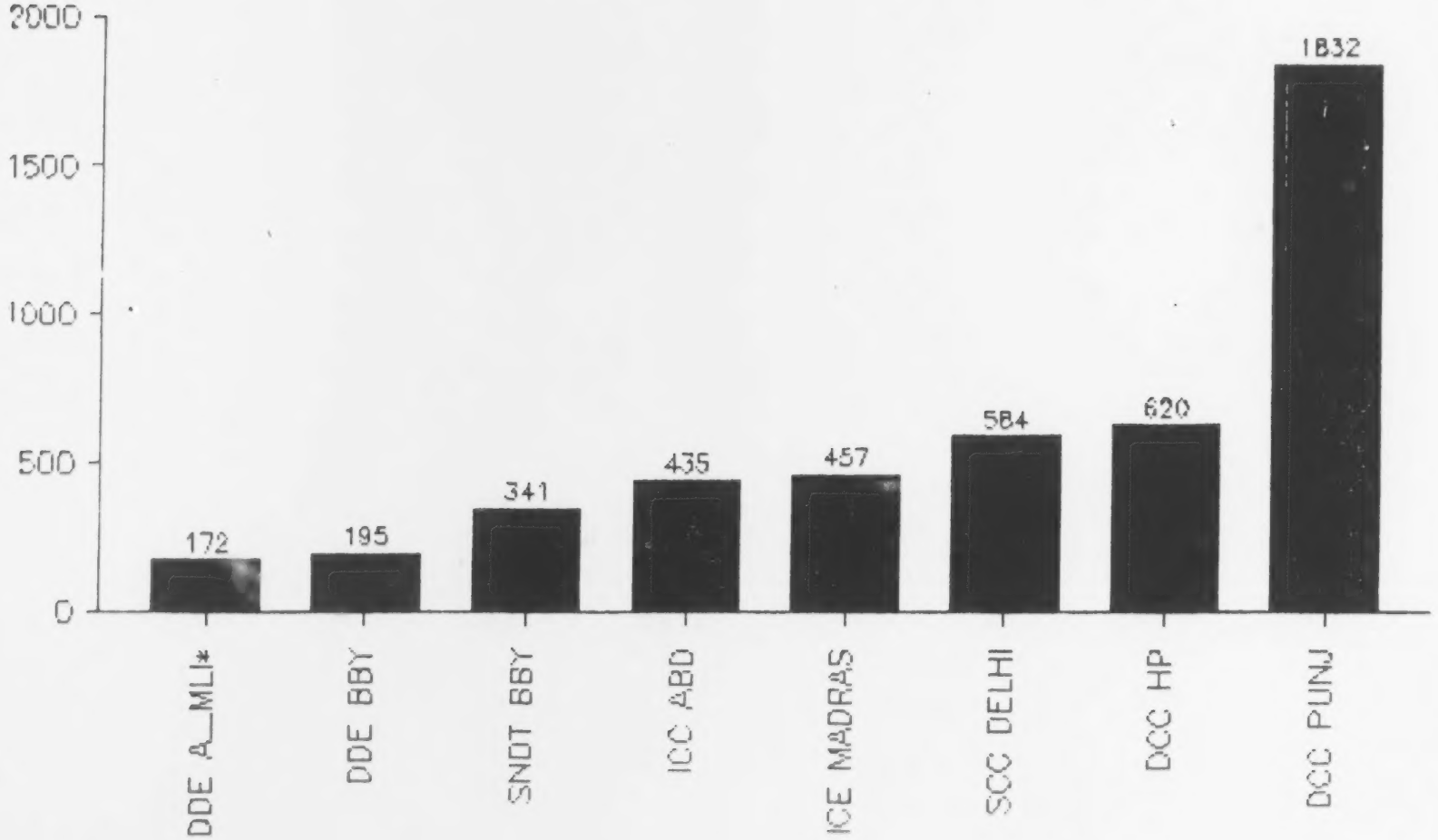
Table 6: Cost per student in different institutions of distance education

Institution		Aca.cost per student	Non-Aca. cost per student	Other costs per student	Total cost per student
ICE, Madras	1988-89	7.94	63.75	384.88	456.57
DDE, Annamalai	1986-87	53.88	32.00	86.01	171.89
SCC&CE, Delhi	1988-89	180.33	194.64	209.35	584.00
DDE, Bombay	1987-88	41.83	68.77	84.61	195.21
DCC, H.P.	1988-89	191.84	211.79	216.21	619.84
SNDT, Bombay	1988-89	11.25	68.86	260.68	340.79
DCC, Panjab	1988-89	705.60	692.56	434.44	1832.60
ICC&CE, Allahabad	1988-89	---	328.50	106.70	435.20

Table 6, provides information about cost per student in different institutions at current prices. But for DDE Annamalai, figures for other institutions are for 1988-89, they can be considered as comparable. The wide divergence in cost per student can be seen in terms of academic-cost per student ranging from Rs. 8 in ICE, Madras, Rs. 11 in SNDT, Bombay, to Rs. 706 in DCC, Panjab. In between fall SCC&CE, Delhi with academic cost per student as Rs. 180, DCC (Himachal Pradesh) as Rs. 192. Similar variations are noticed in non-academic cost per student from Rs. 32 for DDE, Annamalai to Rs. 64 for ICE, Madras and Rs. 69 for DDE Bombay to Rs. 195 for Delhi, Rs. 212 for DCC (Himachal Pradesh) to Rs. 329 for ICC&CE, Allahabad and the peak of Rs. 693 for DCC, Panjab.

COST PER STUDENT IN DIFFERENT D.E.INST.

(Rs.at 1988–89 prices)



* at 1986–87 prices

If the total cost per student is low, then the scope for incurring expenditure to improve quality of printing, provide a larger duration of PCP and expand library-cum-study centres becomes restricted. This is the situation with regard to DDE (Annamalai) and DDE (Bombay). But since cost per student in Delhi, Panjab and Himachal Pradesh is quite high, other cost per student (support services) can also be maintained at a high level. Again, it reinforces the conclusion that the policies followed towards distance education institutions by different universities determine the components of costs of Distance Education.

RELATIONSHIP BETWEEN ENROLMENT AND COST PER STUDENT

An attempt has been made to determine whether an increase in enrolment leads to a decline in cost per student in distance education. For this purpose, data of cost per student at current prices was deflated at 1970-71 prices by using the consumer price index of non-manual employees. The choice of this deflator had the following rationale.

The types of items used in the provision of distance education range from wages and salaries of administrative and teaching staff, purchase of stationery, printing of lessons, purchase of books, postage etc. Production of each one of these items when broken down into input factors suggests that a major component of the cost is similar to that of non-manual employees. Therefore, the deflator used for converting current into constant price series is consumer price index of non-manual employees.

The results of this exercise are given in table 7.

The technique of regression analysis was used to determine the relationship between enrolment and cost per student. The results for the different institutes are tabulated below:

TABLE 7

COST OF EDUCATION PER STUDENT BY DIFFERENT CORRESPONDENCE COURSES IN INDIA

IN RS. CONSTANT (1970-71) PRICES

YEAR	DELHI UNIV.		BOMBAY UNIV.		SNDT UNIV.		H.P. UNIV.		MADRAS UNIV.		PUNJAB UNIV.		ALLAH. UNIV. ABAD		PATNA UNIV		ANNA. UNIV. MALAI	
	ENROL	COST	ENROL	COST	ENROL	COST	ENROL	COST	ENROL	COST	ENROL	COST	ENROL	COST	ENROL	COST	ENROL	COST
1975-76	13,722	195.93																
1976-77	13,747	215.46																
1977-78	13,202	218.30																
1978-79	11,123	217.74	12,054	70.97	1,980						10,011	313.05						
1979-80	8,355	241.29	6,585	123.31	1,980	82.23	10,830	237.48			9,101	314.34			523	263.48		
1980-81	6,482	376.47	5,280	136.39	5,329	41.94	11,042	209.49			9,460	329.82			687	229.19		
1981-82	6,759	362.46	6,698	95.19	5,309	42.17	11,701	166.89			9,150	293.68			1,958	122.27	21,052	32.45
1982-83	9,822	244.92	7,448	82.98	8,478	26.28	11,701	128.07	9,615	208.20	8,741	318.47			1,567	169.74	25,397	40.26
1983-84	13,825	214.55	9,412	74.85	9,235	45.48	8,321	168.66	20,584	159.29	9,321	297.45			1,365	178.21	24,565	50.88
1984-85	18,250	182.16	12,302	42.62	10,129	48.06	6,944	209.35	42,214	87.96	7,775	370.51	1,591	88.04	1,698	152.57	30,420	48.87
1985-86	21,466	176.53	12,701	51.95	9,152	53.46	7,181	197.73	67,968	81.75	8,899	296.35	2,331	68.62	2,268	169.77	39,311	40.76
1986-87	22,743	168.84	12,822	58.53	11,054	45.76	7,838	198.08	78,123	60.30	8,783	314.96	1,602	143.36	2,376	160.51	41,554	48.13
1987-88	27,478	165.10	15,148	50.76	10,868	60.47	6,715	230.01	92,737	71.71	9,713	333.44	2,291	112.16	3,616	102.61		
1988-89	33,853	164.00			11,752	60.50	13,090	154.96	94,425	114.15	7,719	458.15	2,940	123.66	4,167	92.10		

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Table 1: b coefficients of different distance education institutions in India

			Value of R
1.	Directorate of Correspondence Courses Panjab University, Chandigarh	-0.046	-0.70
2.	Directorate of Correspondence Courses Patna University, Patna	-0.0408	-0.89
3.	Institute of Correspondence Courses Bombay University, Bombay	-0.0083	-0.90
4.	Directorate of Distance Education Himachal Pradesh University, Shimla	-0.0076	-0.52
5.	School of Correspondence Courses and Continuing Education, Delhi University	-0.0068	-0.80
6.	Directorate of Correspondence Courses Allahabad University, Allahabad	-0.0018	-0.04
7.	Department of Correspondence Courses and Distance Education, SNDT University, Bombay	-0.0013	-0.27
8.	Institute of Correspondence Education Madras University, Madras	-0.0012	-0.79
9.	Directorate of Distance Education Annamalai University, Annamalai	+0.0003	+0.36
	Pooled Regression for all distance education institutions	-0.002	

Since distance education institutions work in different environments, the b co-efficients of the nine distance education institutions show a wide range of variation. The co-efficient was as low as +0.0003 in the case of Annamalai to as high as (-) 0.046 in the case of Panjab. Among the distance education institutions which showed high co-efficients were Panjab (-0.046), Patna (-0.0408), Bombay (-0.0083), Himachal Pradesh (-0.0076) and Delhi (-0.0068). As against them, those which showed low co-efficients were Allahabad (-0.0018), SNDT Bombay (-0.0013) and Madras (-0.0012).

The co-efficient of correlation showed a negative and strong correlation between enrolment and cost per student in the case of ICE,

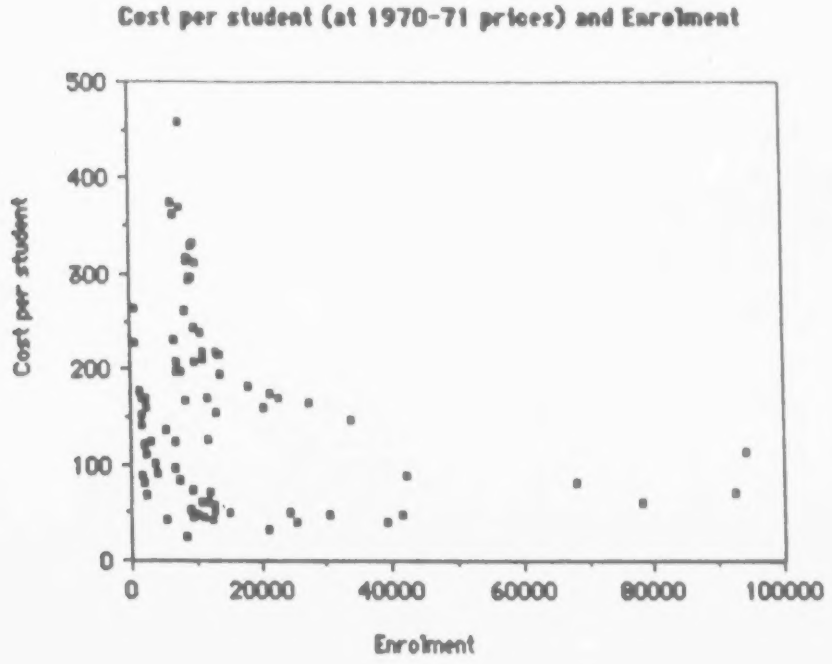
Bombay, (-0.90), DCC Patna (-0.89), SCC&CE Delhi (-0.80), ICE Madras (-0.79), DCC Panjab (-0.70). In the case of 3 institutes, correlation was negative but weak. These institutes were DDE Shimla (HP) (-0.52), SNDT Bombay (-0.27) and DCC Allahabad (-0.04). In the case of only one directorate, correlation was positive, though weak i.e. DDE Annamalai (+0.0003).

For a diagrammatic presentation of the relationships, see Chart I, Chart II and Chart III.

Pooled Regression Analysis

To assess the relationship between enrolment and cost per student, since observations of each directorate were relatively few, it was difficult to arrive at firm conclusions. It was, therefore, decided to pool all the observations of 9 distance education institutions. These 83 observations were plotted in a graph.

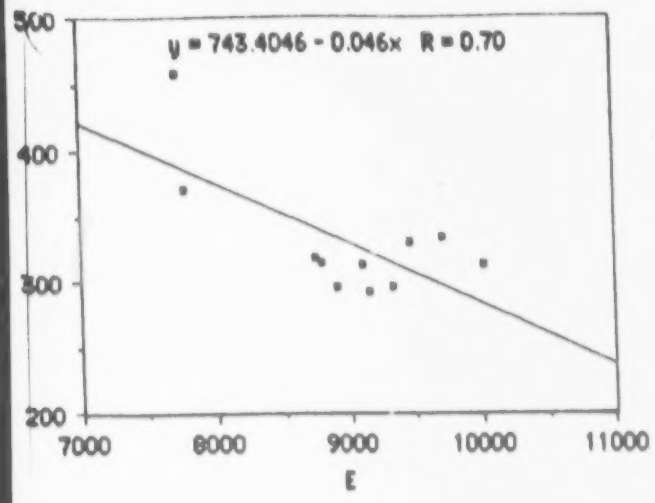
GRAPH SHOWING THE RELATIONSHIP BETWEEN ENROLMENT AND COST PER STUDENT



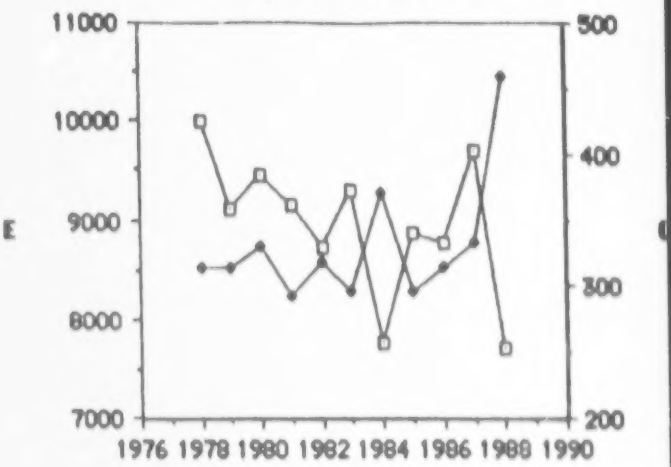
RELATIONSHIP BETWEEN ENROLMENT AND COST PER STUDENT IN DISTANCE EDUCATION

CHART 1

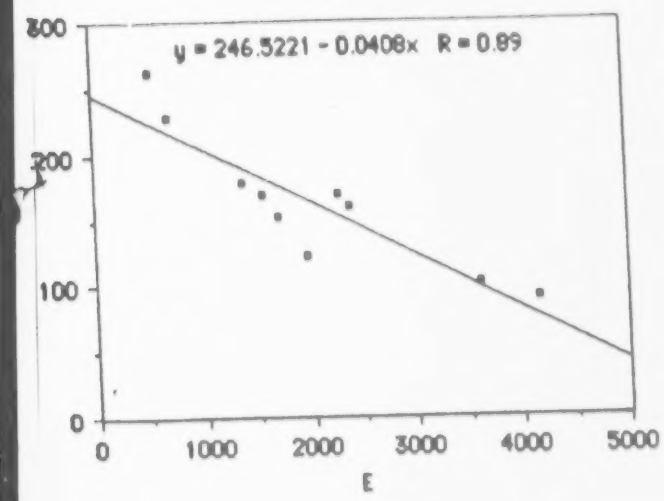
Punjab University



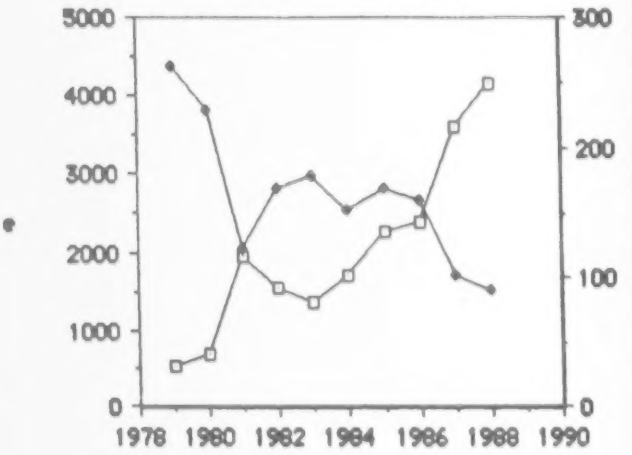
Punjab University



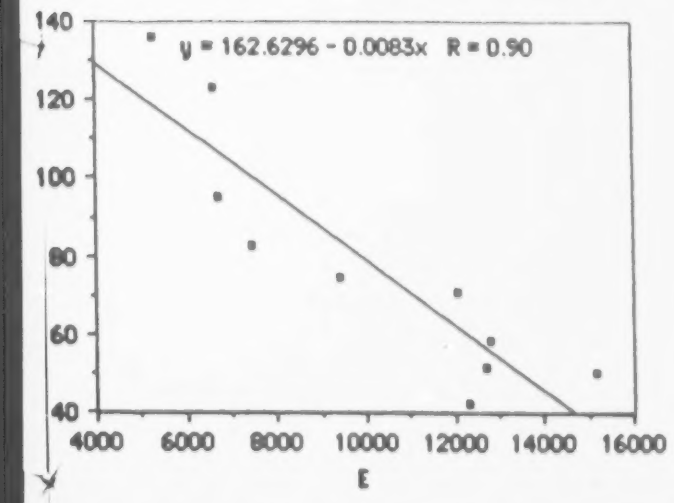
Patna University



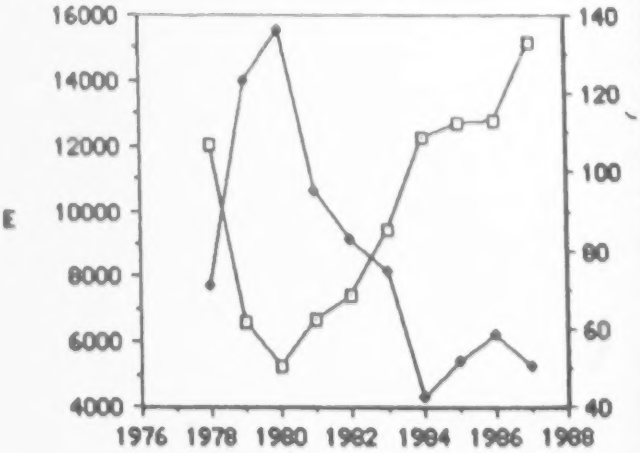
Patna University



Bombay University



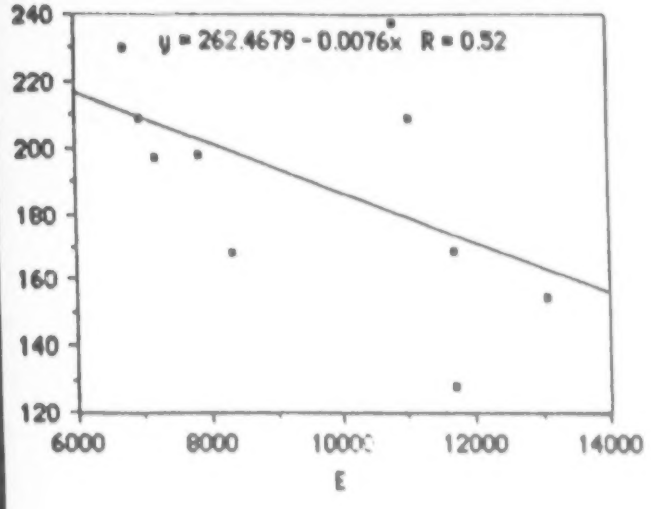
Bombay University



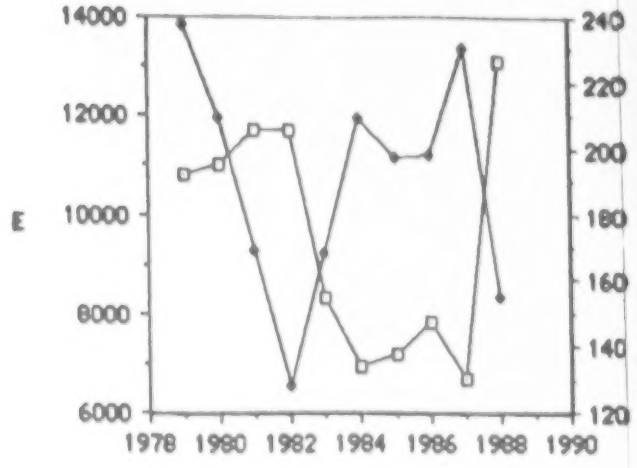
E
C

CHART 11

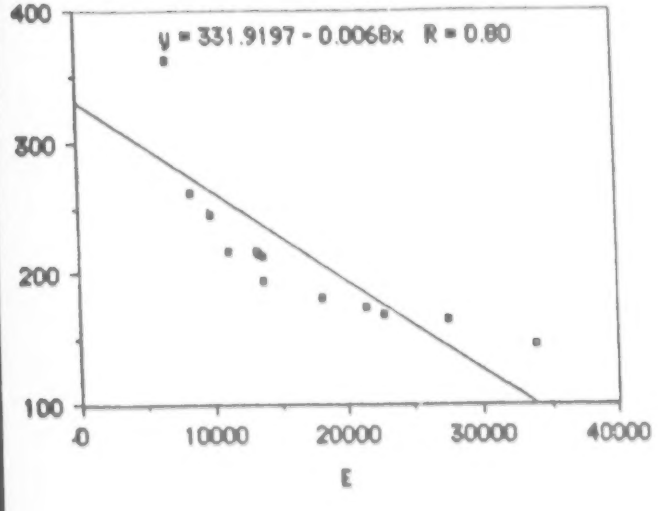
Himachal Pradesh University



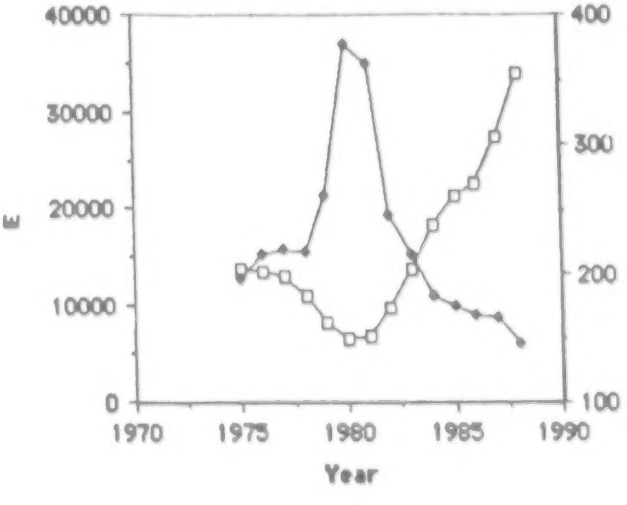
Himachal Pradesh University



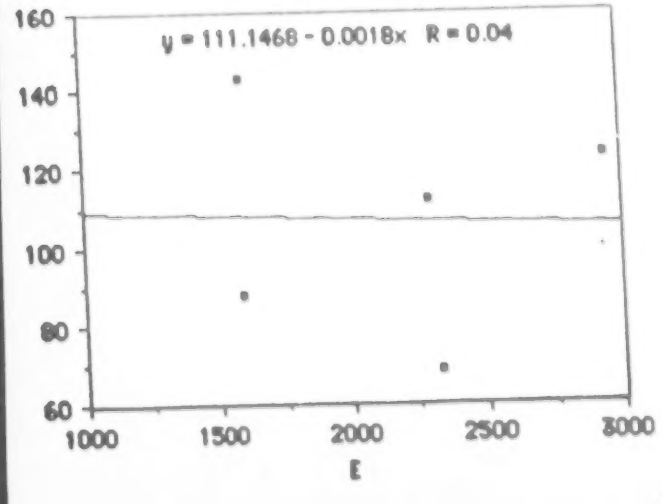
Delhi University



Delhi University



Allahabad University



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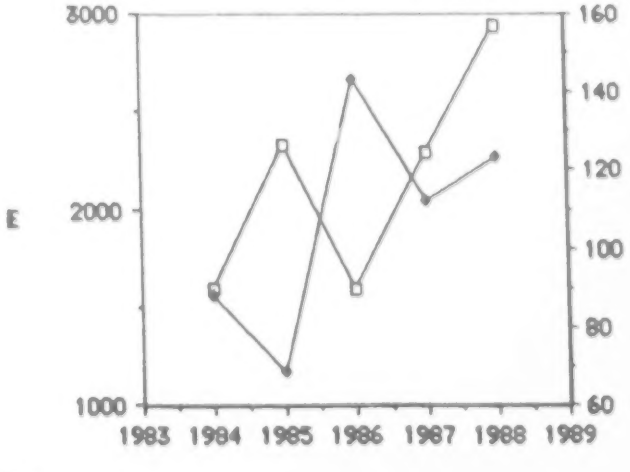
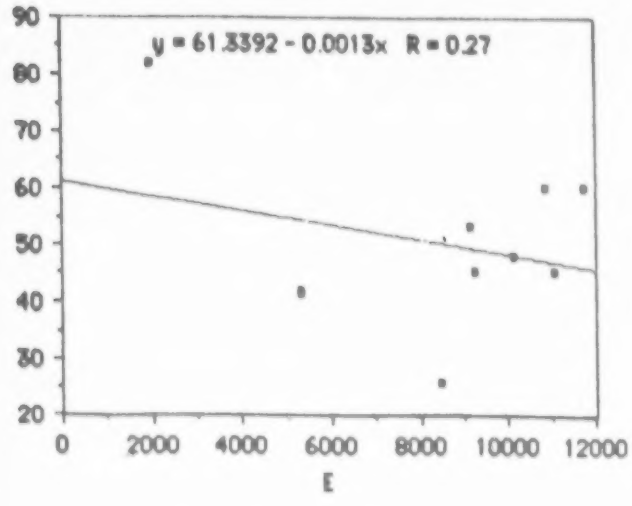
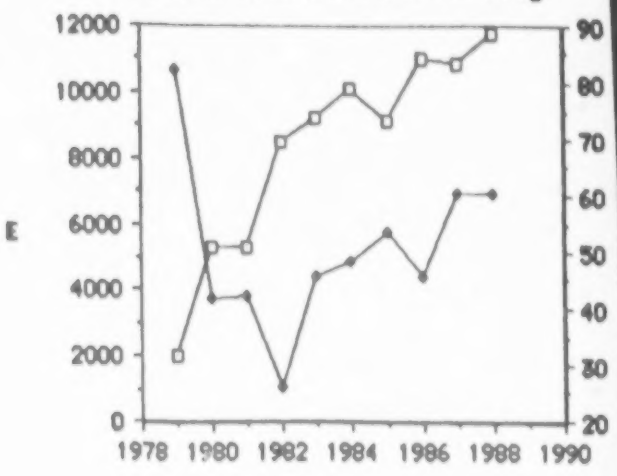


CHART III

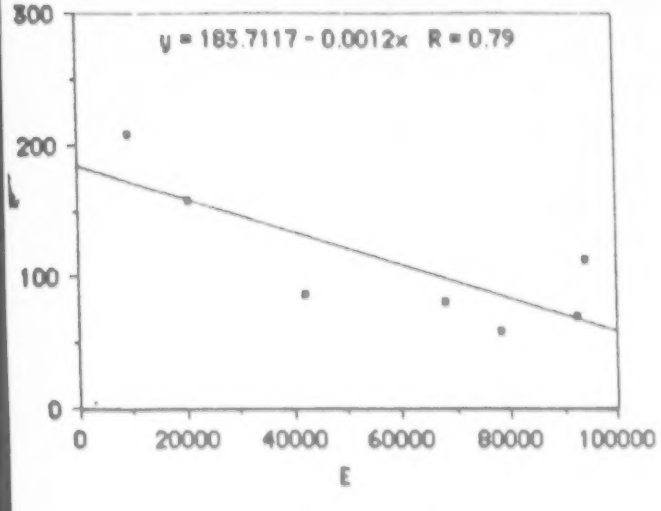
SNDT Women's University



SNDT Women's University

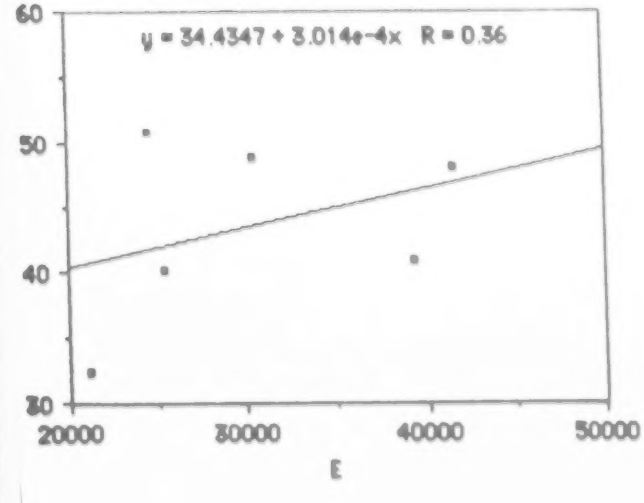


Madras University

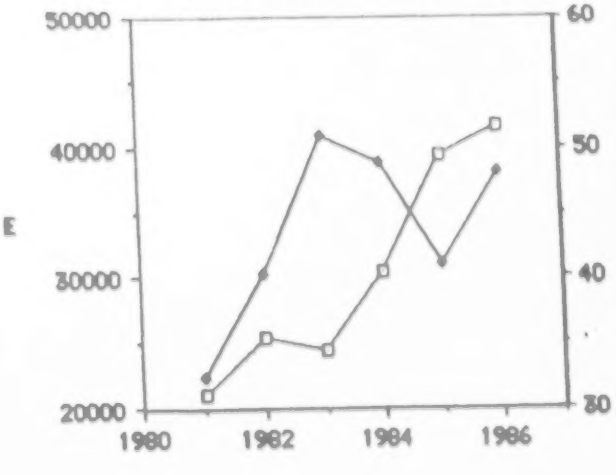


Madras University

Annamalai University



Annamalai University



The graph indicates a clear and negative relationship between enrolment and cost per student, it shows that as enrolment increases, cost per student has a tendency to decline.

The pooled regression analysis for 83 observations of all the distance education institutions, using dummy variables for each institution separately, yielded the following result.

$Y = 255.148 - 0.002 X$

Pooled regression analysis confirmed the negative relationship between enrolment and cost per student.

COURSEWISE COSTS

Coursewise analysis of costs was attempted in the case of two institutes: Directorate of Distance Education, Annamalai and School of Correspondence Courses and Continuing Education, Delhi.

DDE Annamalai -- Case Study

Table 8: Coursewise cost per student for Directorate of Distance Education, Annamalai

(At 1970-71 prices)

	1981-82	1982-83	1983-84	1984-85	1985-86
Undergraduate	28.5	37.0	43.7	57.5	36.0
Post-graduate	33.1	40.9	52.3	47.0	41.9
Total	32.5	40.2	50.9	48.4	40.9

But for the year 1984-85, cost per student at constant prices are lower at the undergraduate level than at the post-graduate level. This indicates that starting more and more post-graduate and diploma courses is likely to lead to a rise in the cost per student. A deeper analysis of 1984-85 data reveals that two courses viz., B.Ed. course and Diploma in Management with an enrolment of 10,723 and 3,116 respectively showed much lower cost per student as against the overall average. Similarly M.A. Sociology with an enrolment of 2,012 students also indicates relatively much lower cost per student. Since these

three courses (B.Ed., Diploma in Management and M.A. Sociology) accounted for 15,851 students i.e. 60 per cent of total enrolment in all post-graduate courses, the overall impact of their high weightage was to lower overall cost per student in post-graduate courses.

Coursewise enrolment and Cost Per Student

Another exercise was attempted to find whether there is any correlation between coursewise enrolment and cost per student (Measured at current prices). The relationship was tested for 1984-85 and 1985-86. In Directorate of Distance Education, Annamalai University there were 22 courses being run in 1984-85 and 24 courses in 1985-86. Data of enrolment showed that enrolment varied from less than 100 to over 11,000 in a course. The hypothesis tested was: Whether a larger enrolment in a course led to a decline in cost per student?

For 1984-85, the following results of the regression analysis were obtained.

$$Y = 71.04985 - 0.00469\ X$$

$$R = -0.36695$$

For 1985-86, the following results of the regression analysis were obtained.

$$Y = 204.77641 - 0.0140\ X$$

$$R = -0.2486$$

From the results of the both the sets of data (1984-85 and 1985-86) it became clear that there is a negative correlation between enrolment and cost per student, though the R values indicate that the relationship is weak and not very significant. The hypothesis that increase in enrolment results in a decline is costs was found to be valid on a coursewise basis.

SCC & CE DELHI -- CASE STUDY

Coursewise cost between enrolment and cost per student for 3 years i.e. 1986-87, 1987-88 and 1988-89 was calculated for the SCC&CE, Delhi. The analysis revealed the following:

Table 9: Enrolment and Cost per student for different courses in the School of Correspondence Courses, Delhi

Course offered	Total number of students during the period 1986-87 to 1988-89	Weighted average cost per student at 1987-88 prices for the period 1986-87 to 1988-89	Index of Unit cost with the overall average = 100
B.A. (P)	51,046	544.82	89.2
B.Com. (P)	24,607	550.84	90.1
B.Com. (H)	3,098	856.16	140.1
B.A. (Hons)	208	1,067.98	174.8
M.A. Hindi	1,642	1,277.00	209.0
M.A. Pol.Sc.	887	1,399.16	229.0
M.A. History	226	2,403.71	393.4
M.A. Sanskrit	337	2,310.76	378.2
M.Com.	2,023	1,222.33	200.0
Total	84,074	611.05	100.0

In Table 9, total enrolment for the 3-year period (1986-87 to 1988-89) has been taken as independent variable (X) and cost per student as dependent variable (Y).

The regression equation works to be:

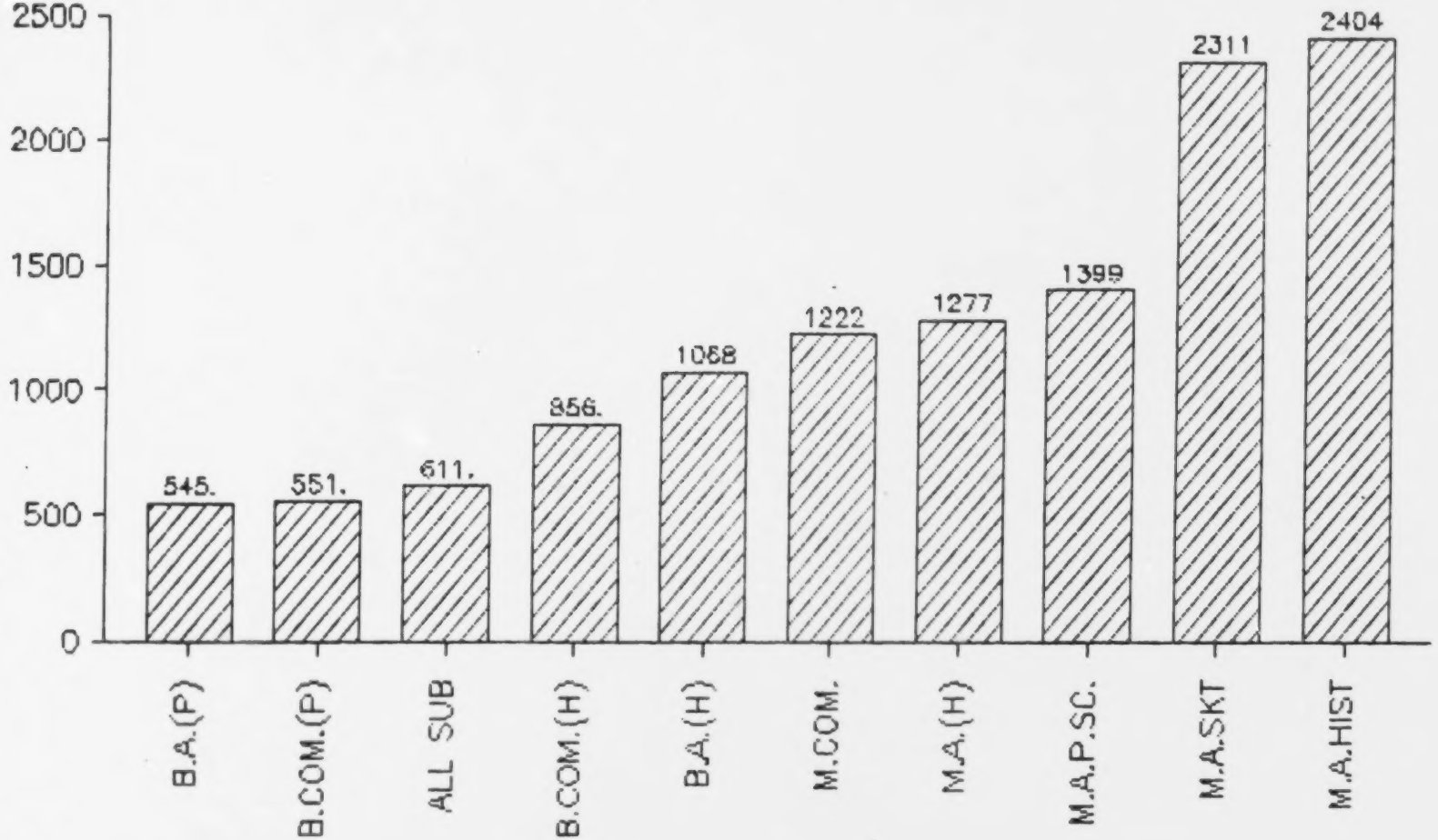
$Y = 1511.5981 - 0.0235\ X$

$R = -0.60772$

The analysis highlights the fact that courses with larger enrolment tend to have lower unit cost than courses with smaller enrolment.

WTD.AV.COST PER STUDENT AT 1987-88 PRICE

for the period 1986-87 to 1988-89



SCHOOL OF CORRESPONDENCE COURSES DELHI

Since R = (-) 0.60772, obviously, the relation between cost and enrolment is negative and significant. It only implies that the School of Correspondence Courses and Continuing Education, Delhi like a multiproduct firm has courses with very high enrolment and courses with low enrolment. The low enrolment courses tend to have highly unit costs and high enrolment courses tend to have lower unit costs. Although in the sphere of education, it would not be appropriate to run only such courses which have lower unit costs but it would be better to combine lower unit cost courses having larger enrolment with higher unit costs courses so that to the society, the average unit cost is much lower. In the School of Correspondence Courses, average unit costs for all courses is Rs. 611, although it is as low as Rs. 545 for B.A. (Pass) course and Rs.550 for B.Com. (Pass) course respectively and as high as Rs. 2,311 for M.A. Sanskrit and Rs. 2,404 for M.A. History. The range of variation from the overall average for all courses works out to be between 89 to 394 per cent.

Comparison of Cost per Student in School of Correspondence Courses, Delhi with 12 Colleges of Delhi University

Out of 53 colleges affiliated to Delhi University, a sample of 12 colleges in different enrolment ranges were taken: 2 with an enrolment of less than 1,000; 3 with an enrolment between 1,001 to 1,500, 5 in an enrolment range of 1,501 to 2,000 and 2 with an enrolment of more than 2,000.

Cost per student for these colleges was calculated for 1985-86, 1986-87 and 1987-88. The cost was converted into cost per student at 1987-88 prices. To remove any abnormality, average of three years was taken. The results of this exercise are as under:

Table 10: Average enrolment and cost per student for Delhi Colleges

	Colleges	Average Enrolment for 1985-86 to 1987-88	At 1987-88 prices: Average cost per student for 1985-86 to 1986-87 (Rs)
		(X)	(Y)
1.	St. Stephen's College	987	5,814
2.	Miranda House	2,105	5,364
3.	K. M. College	2,087	4,710
4.	I. P. College	1,833	4,952
5.	Zakir Hussain College	2,030	4,601
6.	SGTB Khalsa College	2,239	4,213
7.	Vivekananda Mahila College	1,147	4,211
8.	Swami Shradhnanda College	2,023	3,489
9.	Satyawati College (M)	1,636	3,750
10.	Zakir Hussain College (E)	1,326	3,466
11.	SGTB Khalsa College (E)	1,325	2,746
12.	Satyawati College (E)	1,057	2,569

An average of 12 colleges revealed that cost per student in regular colleges of Delhi University was Rs. 4,217 as against Rs. 651 in the School of Correspondence Courses. This implies that it was possible to provide instruction to 6.5 students in the School of Correspondence Courses as against 1 student in a regular college with the same cost.

Co-efficient of correlation between enrolment and cost per student for the colleges is +0.277 which indicates that correlation is positive but insignificant. Obviously, with growth of enrolment, there would be certain other factors such as diversification of courses, introduction of honours and science courses which may be working in favour of an increase in cost.

The regression equation for 12 colleges worked out as under:

$Y = 3165.3 + 0.601 X$

The positive value of b = +0.601 indicates that where a college expands its enrolment, it would not multiplicate sections in a course which it is running already. But more importantly an institution intends to diversify its courses, start new honours or science courses or certain vocational courses which raise the prestige of the institution, but are at the same time more costly.

Factors determining cost per student in Delhi University Colleges

For making an analysis of factors determining cost per student, data for 30 colleges was colleted for 1987-88.

Cost of education per student was considered to be dependent on 5 variables (i) Total enrolment, (ii) proportion of honours students in total enrolment, (iii) age of the college, (iv) type of management - public or private trust, and (v) nature of the college - Day or Evening College.

Regression analysis indicated that three variables out of the 5 listed above were insignificant. They were (i) age of the college, (ii) type of management (Dummy variable) and (iii) nature of college (Dummy variable).

From the regression, it was confirmed that two variables i.e. (i) enrolment and (ii) proportion of honours students in total enrolment are positively correlated to unit cost.

The regression output by dropping three variables and conducting regression analysis (C dependent variable and D (enrolment) and E (proportion of honours to total students) revealed the following:

Regression Output

Constant = 2030.023

Standard error of Y estimate = 748.722

R Squared = 0.649

No. of observations = 30

Degrees of freedom = 27

	D	E
X co-efficient(s)	1.181	22.234
Standard error of co-efficient	0.356	7.426

The values of D and E confirm that they are significant since the value of X co-efficients in both cases is more than 2.5 times the value of the standard error.

To summarize the results of our study:

(i) The hypothesis that increase in enrolment leads to a decline in costs is rejected. In fact, increase in enrolment in case of Delhi Colleges is positively and significantly correlated with costs.

(ii) The hypothesis that a high proportion of honours students in total enrolment leads to a rise in unit costs, is proved valid. High percentage of honours students is positively and significantly correlated with unit costs.

(iii) The age of the college is negatively related to unit costs, though not significantly.

(iv) Nature of management - private or public - is not significantly correlated with unit costs.

(v) The nature of the college -- Day or Evening -- is not significantly correlated with unit costs.

The analysis of unit costs of Delhi Colleges reveals that two factors are significant in increasing unit costs -- the increase in enrolment and high proportion of honours students in total enrolment. The latter further pushes cost upwards and thus reinforces the positive effect of the former.

POLICY IMPLICATIONS FROM THE STUDY

The study has highlighted the following points:

1. Several institutes of distance education generate surpluses and use them either to create infrastructures or to augment the general revenues of the Universities. Although the University Grants Commission has stipulated that resources generated from student fees should in no case be utilised for the general purposes of the University, this has not been observed in practice. There is a need to stress this point far more effectively so as to prevent misdirection of resources.

2. Although there is no guarantee that sanctioning more faculty positions leads to improvement in the quality of distance education, it is equally true that having no faculty in distance education institutions or a very small faculty cannot bring about improvement in the organisation of instruction. It would be, therefore, proper to appoint core faculty in each subject when a course is introduced. Since preparation of reading materials requires maturity, accurate expression and academic acumen, it would be more desirable to have senior faculty positions in the directorates.

3. Distance education requires supporting staff for a variety of jobs which are not generally performed in formal education. For instance, specifically trained staff for preparation of reading materials, editors for manuscript correction, proof reading, designers, etc. is needed. Similarly, staff is needed for audio and

video cassette preparation. There is a need to develop norms of non-academic or supporting staff commensurate with the needs of distance education.

4. Let alone institutions with small enrolment, most of the DE institutions indicate a negative and significant relationship with cost per student. Since costs at undergraduate level are generally much lower than those at the post-graduate level, those institutions in which undergraduate enrolment is relatively large help to support the high cost at PG level and still result in overall lower costs. A judicious blend of courses both at the UG and the PG level is required so that the economies of scale may be reaped.

5. As against a negative relationship between increase in enrolment and cost per student in distance education, there is a positive correlation between enrolment and costs per student in regular colleges. From a social point of view, distance education is a cheaper technique to meet the growing aspirations of the people to acquire higher education. The cost of providing instruction to one student in a regular college is equivalent to cost of providing 6.5 students in distance education.

6. State support in enriching distance education is much less than in formal education. For instance, state support per student in 1987-88 in Delhi Colleges was Rs. 4,744 as against Rs. 328 per student in distance education. In other words, state subsidy per student for 14.5 students in distance education was equivalent to subsidy for one student in formal system. The state should, therefore, lend more support to DE which is relieving the formal system of additional burdens that would fall on it.